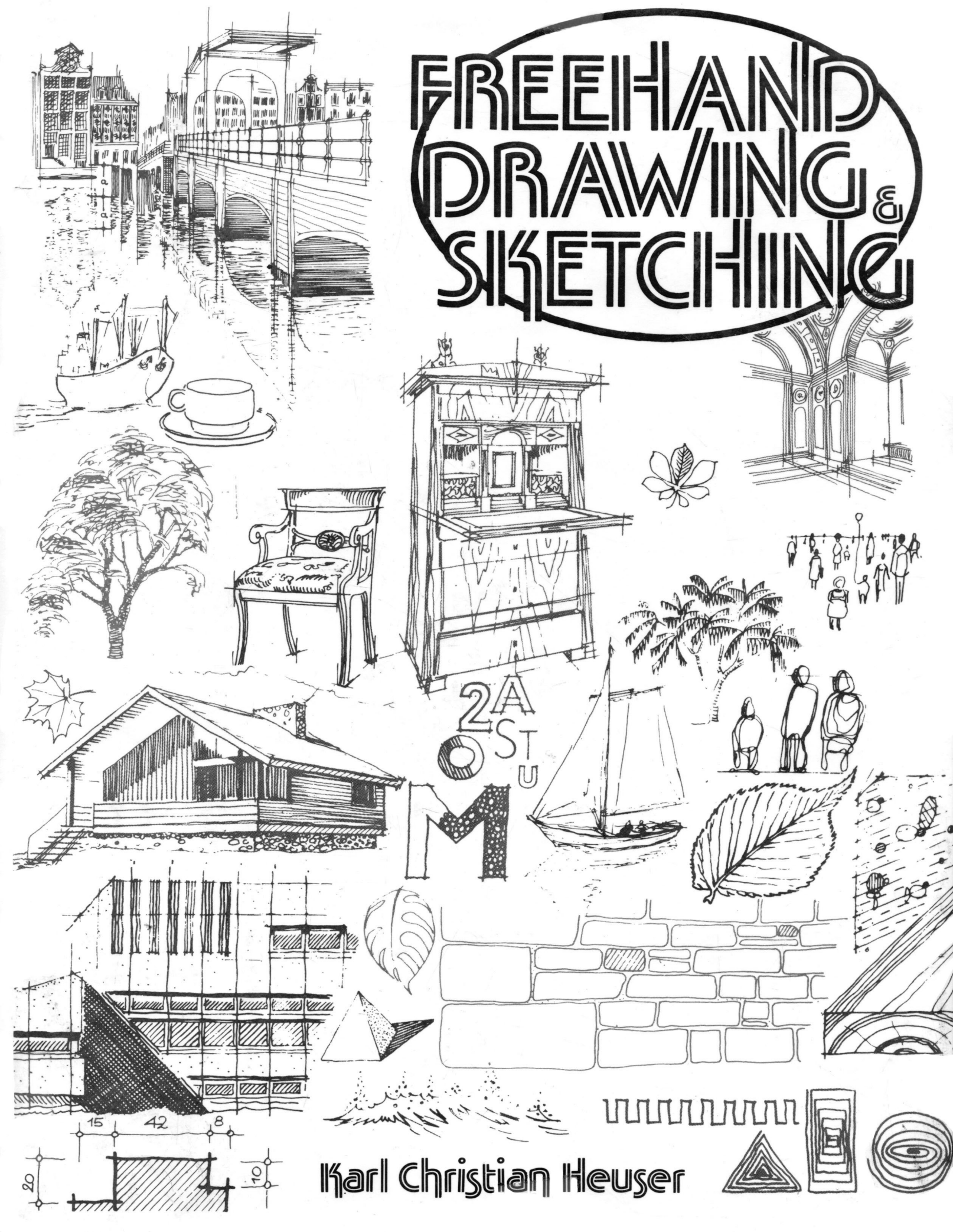


Karl Christian Heuser

Foreword

Freehand drawing gives us five main advantages:

1. First of all, things that do not as yet actually exist can be illustrated almost as if they did. When drawn freehand, planned buildings, rooms, landscapes, pictures, motifs, scenes, etc., become immediately visible in three-dimensional form. The advantage of the "artist's impression" is that all our ideas can quickly take positive shape by means of the freehand sketch.

2. A comprehensive and accomplished freehand drawing can illustrate and "demonstrate" an object far more clearly than all other techniques. In an age when we are being force-fed with TV, film, and photography, the drawing leaves a more lasting impression and is often more pleasing to the eye.

3. The sheer pleasure of seeing the visible result of our own efforts as a wholly personal act and achievement, one which is permanent, lasting, and frequently beautiful too.

4. Our powers of perception are greatly enhanced: freehand drawing compels us to sort the essentials from the banal and hence to see things more profoundly.

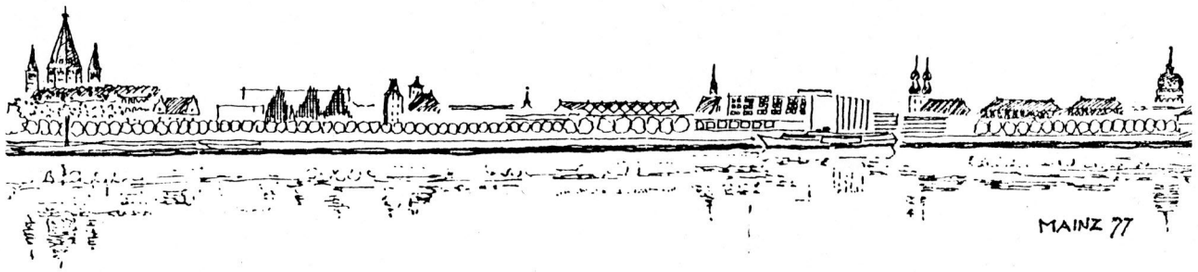
5. Our entire way of life is visibly expanded and enriched. Our powers of observation are enhanced, the visual memory strengthened, the imagination trained, the feeling for form and space is heightened; we learn to see the essence of things—i.e., our ability to abstract is better trained.

There are many substitutes, but even in the age of advanced photographic, atomic, space, automation, and production technologies, we simply cannot do without freehand drawing.

The rapid sketch will always assist and expedite the exchange of information in a discussion, and many an expert will assert that one drawing is worth a thousand words of explanation.

Freehand drawing can capture an initial concept or idea for interior designs or designs in other fields, e.g., mechanical engineering.

In the environment, freehand drawing can awake our interest in many of life's little details which we might otherwise overlook. As we learn to draw freehand we learn to look at our surroundings more intensively, to perceive things more clearly and understand them better.



Drawing and freehand drawing have for thousands of years been techniques which man can and has mastered (look at the cave paintings over ten thousand years old). The motivation came from a need for ornamentation, the retention of sensory impressions, or the transmission of information pure and simple.

The portrayal of self and surroundings has always been one of man's elementary requirements and manifests itself in many different media and ways (including freehand drawing); the specific medium will be determined by such factors as environment, education, and possibilities of self-development.

In previous times, for example, one's own half-timbered dwelling, with its carvings and color scheme, was a very personalized object. Today, on the other hand, the sole individual form of expression is often only the choice of color for a house picked out from a builder's catalog of ready-made homes.

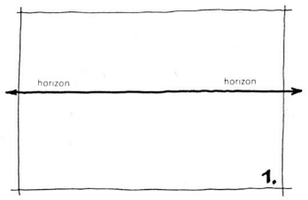
Freehand drawing opens up a whole new area of personal freedom which can captivate us as an intensive hobby to be pursued passionately—and one that is also inexpensive and uncomplicated.

Freehand drawing can enrich and broaden the experience of a holiday or journey. And if there is no picture, photo, or brochure handy, we can quickly draw or sketch an object we wish to show to someone else.

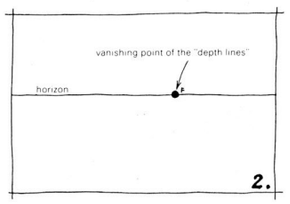
There is no doubt that the modicum of effort and patience needed to learn to draw freehand will be richly and diversely rewarded.

Karl Christian Heuser

Sketching a three-dimensional view (step-by-step construction of a drawing).
The book is also laid out in step-by-step form.



Step 1. Draw horizon at eye level (straight across from left to right).



Step 2. Determine the vanishing point on the horizon (an eccentric position avoids uninteresting symmetry).

until the whole sequence of movements which produces the strokes has become steadier. In your efforts to overcome that cramped position and to draw the strokes briskly—and this should come right at the beginning of your exercises—some comfort may be taken from the knowledge that almost every drawer has been faced with the same problems at one stage or another, and has managed to overcome them. Now and then you should take a long, hard, critical look at your drawings from some distance away (two to three meters). This will help you to identify areas for improvement in terms of filling the paper, light and

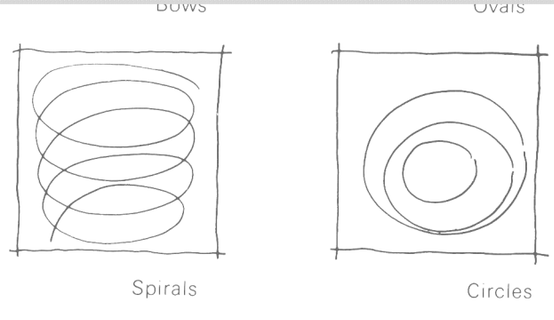


Figure 2.1

1.0 Freehand Drawing—It Can Be Learned

1.1 Drawing

In the modern technological era, the ability to convey ideas clearly and convincingly is more important than ever before.

While problems and concerns can be succinctly conveyed through concise speech and unequivocal gesture, technical and structural problems can often only be explained with the aid of signs and symbols drawn on paper. This is where freehand drawing can have a special part to play, and it is no exaggeration to claim: "Anyone can learn to draw freehand provided he's willing!"

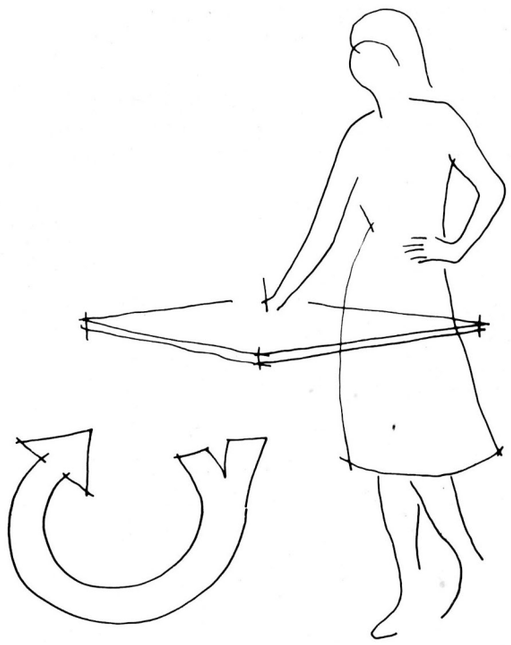
graphic representation becomes meaningless the moment that a camera's easy handling turns critical selectivity into snapshot mania. Just as with drawing and composition, really good photography is dependent upon the patient and concentrated observation of the subjects to be portrayed.

"Drawing" can be interpreted as "making signs and symbols of something," a process in which the essence of an object is sketched, emphasized, and brought out. As a consequence, irrelevant matter must be omitted since it merely dilutes the major point of information. In certain instances this can even entail leaving out the entire surroundings and concentrating on the essential fea-

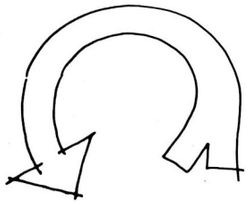
about one centimeter away from the existing line (on a blackboard), or one-half centimeter on paper.

After practicing on a blackboard or sheet of paper pinned up on the wall, stand at your table and draw the same strokes with hand and arm swinging back and forth over the horizontal paper. It is important here to sway with the whole body without supporting it on the free (nondrawing) hand. Finally, after practicing on wall and table one should try to make the strokes more disciplined and precise.

Remember—never overfill the paper, rather take a fresh sheet.



Practice all circles from left to right and from right to left.



2.2 Lines—Strokes—Dots

At some stage in your life you will have tried to draw straight lines freehand. You may have been fortunate enough to have had an excellent teacher who made the lessons so interesting that you have absolutely no fear of drawing freehand. If not, don't worry! Success can be achieved even without a helping hand. After all, freehand drawing means applying simple strokes to paper without the aid of ruler or T square. To draw straight lines the hand should rest firmly on the paper and only the hand and forearm should move across the drawing—slowly at first, then more briskly later on.

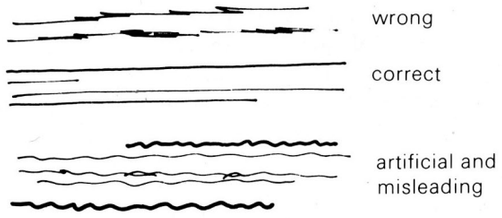


Figure 2.2 Line Quality

Begin by trying to draw a single straight line; you must decide exactly where this line is to start and end. Wait, don't draw yet! It is vital that you draw the whole line in a single stroke from start to finish without stopping in the middle.

If for any reason you have to interrupt the line, don't ruin it by starting the new one on top of it. You will never achieve a satisfactory result by piling strokes one on top of the other, the resulting differences in stroke thickness will look awful. Your new line should start 2, 3, or 4 millimeters away from the end of the old one.

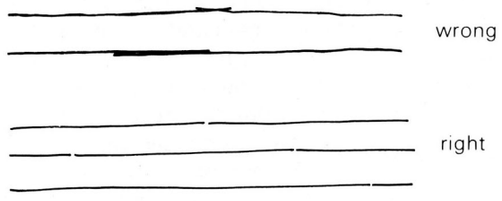


Figure 2.3 Line Continuation

When making corners it is advisable to draw a deliberate cross. This will make your corner quite clear and unmistakable, so please have no fear of crossing over lines.

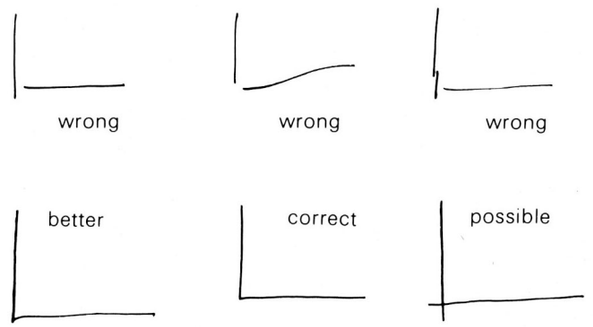
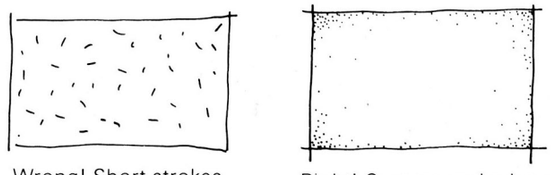


Figure 2.4 "Corners" in Drawing

So far as the thickness of the strokes is concerned, one should leave nothing to chance. The thickness should not be dictated by the pen, pencil, or felt tip but must be the decision of the draftsman alone. Long strokes of even thickness can be drawn by turning the instrument frequently. Dots should really be just that—short strokes that are meant to be dots are very ugly and look as if they have just been "dashed off," a sure sign of carelessness and a superficial approach on the part of the artist.

- Surfaces should be dotted evenly and with a sense of balance. Dots must be really round!
- Deliberate smearing or rubbing of pencil strokes are not the proper techniques of good drawing. These are signs of superficiality, lack of concentration, and slovenliness.

It is not that hard to draw lines evenly over their entire length. With every new pen or pencil you should see whether the desired stroke thickness is maintained and how the instrument has to be held



Wrong! Short strokes in all directions.

Right! Corners and edges are emphasized. Round dots!

Figure 2.5 Dotting Picture Areas

in order to achieve this. Even kings and presidents have their pens and paper tested for evenness before signing important documents.

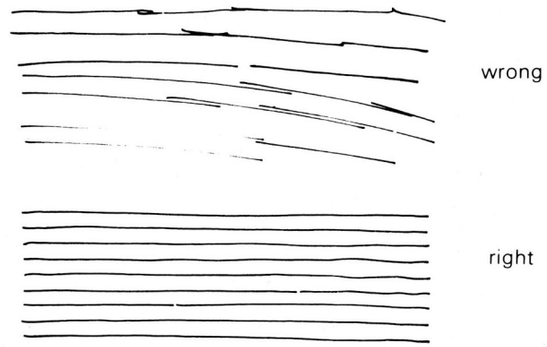


Figure 2.6 Starting New Lines

To assist in practicing, it might be useful to take a sheet of graph paper or paper with ruled lines on which you can happily draw individual straight lines from a conscious beginning to a deliberate finish. Also, try to draw parallel lines horizontally as well as vertically.

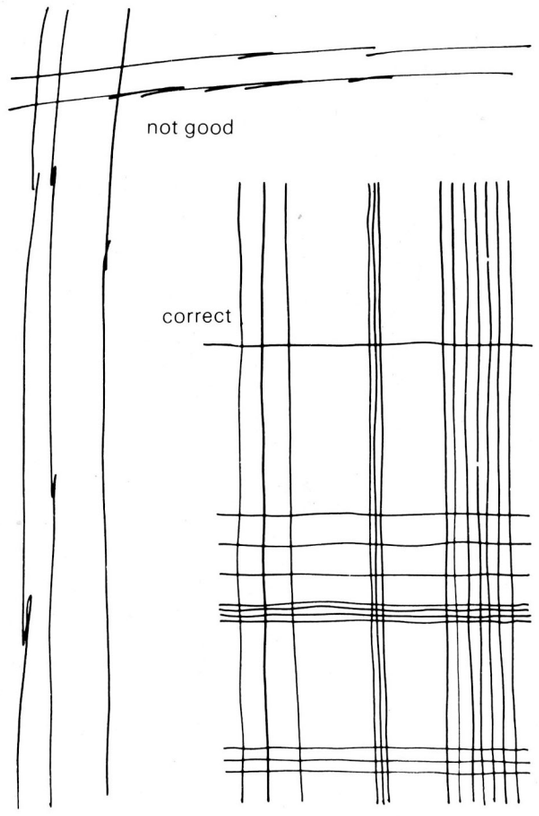


Figure 2.7 "Continuous" Strokes

Once the initially uncertain and perhaps shaky stroke exercises have assumed more discipline and confidence, take a sheet of plain paper and do the following exercises until these too have acquired confidence and self-assurance.

Line exercises

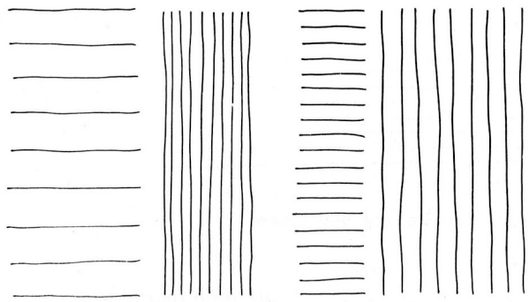


Figure 2.8 Parallel Lines

Here is something else for you to try: drawing straight lines parallel to the drawing board or table edge by steadying the hand on the edge and using it as a guideline.

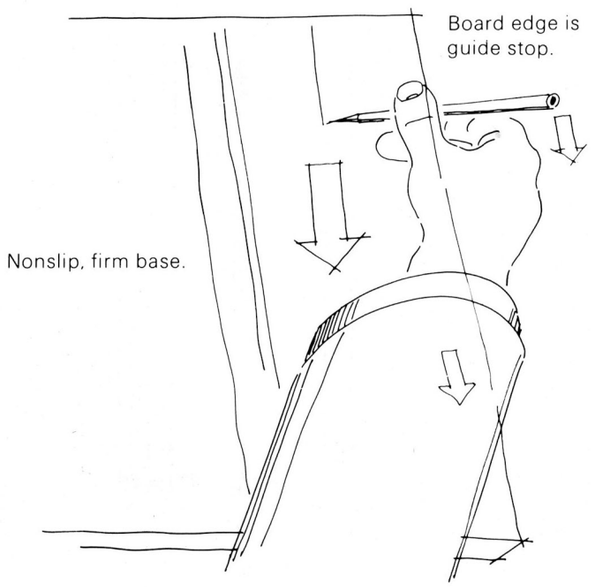


Figure 2.9 Use of Drawing Board Edge as Guide for Straight Lines

2.3 Infilled Areas

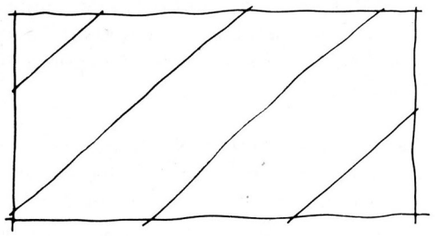
Now and then it will be necessary to fill in a large or small area to make it appear black or very dark. One should always avoid monotonous shading with the same shade of pencil, charcoal, or crayon; it looks unsightly and is not good enough for any acceptable standard of drawing. If a certain area is supposed to look darker than the general background, then the most satisfactory solution is "hatching" with narrowly spaced lines.

2.4 Hatching and Diverging Lines

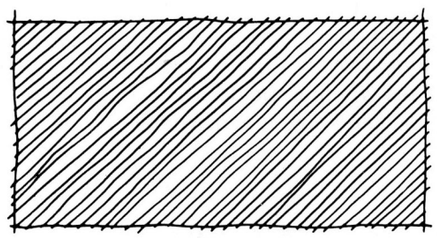
Hatching has two particular features, if done well:

1. the evenness of strokes and their spacing, and
2. the uniform direction of the strokes.

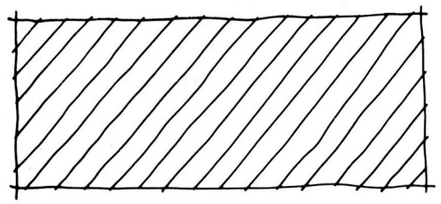
Just take a look at newspapers, magazines, or books; any irregularity of hatching in terms of line continuity, spacing, or direction is immediately noticeable. This means that hatching must be applied as evenly as possible, bearing in mind that too wide a spacing will sacrifice cohesion.



Hatching too widely spaced in relation to the size of the area.



This hatching was drawn very tight.



good

Normal spacing in relation to area size.

Figure 2.10

Hatching should never be done in a hurry. Hurried hatching is yet another sign of carelessness and untidiness in the draftsman, and is bound to give the impression that the same "can't be bothered" attitude carries over into other areas of drawing, like design, dimensions, possible errors, etc.

Diverging lines should be avoided, especially those which intersect the main line at a very sharp angle and leave unpleasant "leftover" areas.

Far too hurried, superficial hatchings (all wrong!):

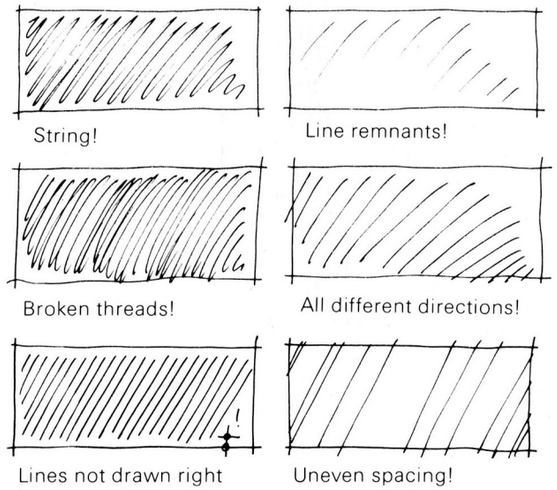
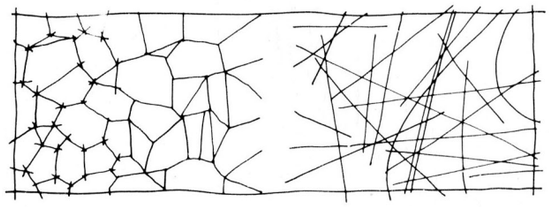
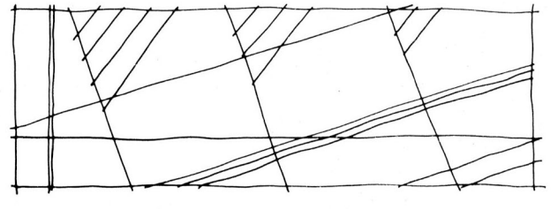


Figure 2.11 Hurried Hatching

Just as a natural stone floor can be displeasing with its slabs of different shapes and colors, areas covered by all sorts of different lines look just as unsightly. The different directions and line lengths have a disturbing effect on the eye, and so we can conclude that a restriction in the number of directions and the avoidance of very acute angles will have a visually positive and pleasing effect in just about any drawing.



Very unsettling, with different line lengths and directions.



Pleasing impression by restricting the number of lines and angles.

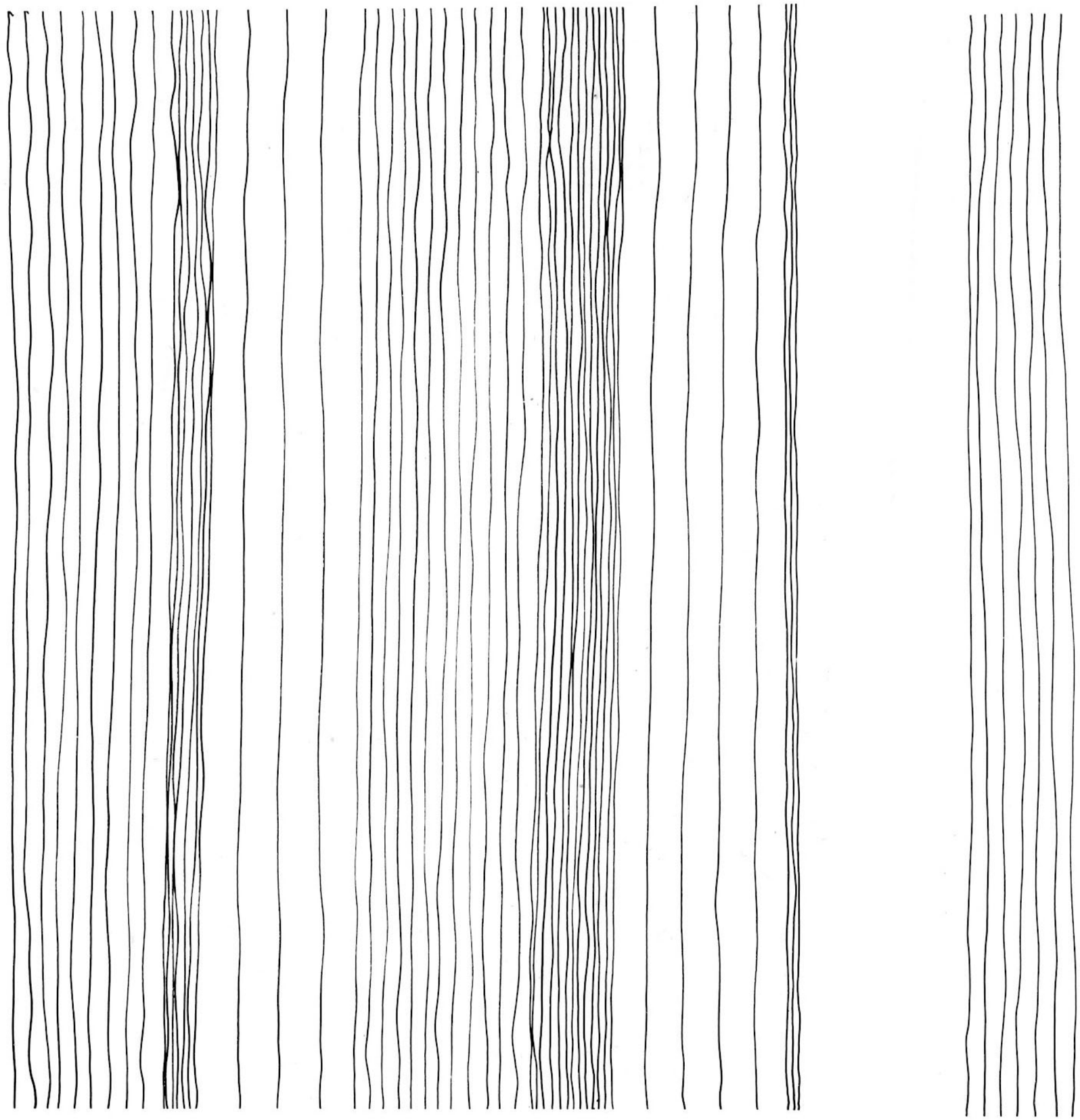
Figure 2.12 Line and Optical Impression

3.0 Line Exercises

And now for a little practice! On the following pages you will find large exercise spaces for your first pencil exercises. The left-hand pages have been drawn on for your guidance, and you should try to reproduce the same lines with the least possible deviation. This will require a certain amount of patience of course; immediate success cannot be expected. The main thing is to draw each line correctly and thoughtfully, and your eye and muscles will gradually acclimatize themselves to straight lines.

Evenness of spacing will need some concentration, but minor irregularities caused by initial lack of practice or by trembling of the hand from the beat of your pulse should not deter you. The body should be relaxed for drawing. The slight physical tremors that can occur following great physical exertion will affect the results on paper.

Turn the book square on its side and draw parallel lines from left to right across the page. You will see it is not that difficult. Each stroke will give you added confidence!



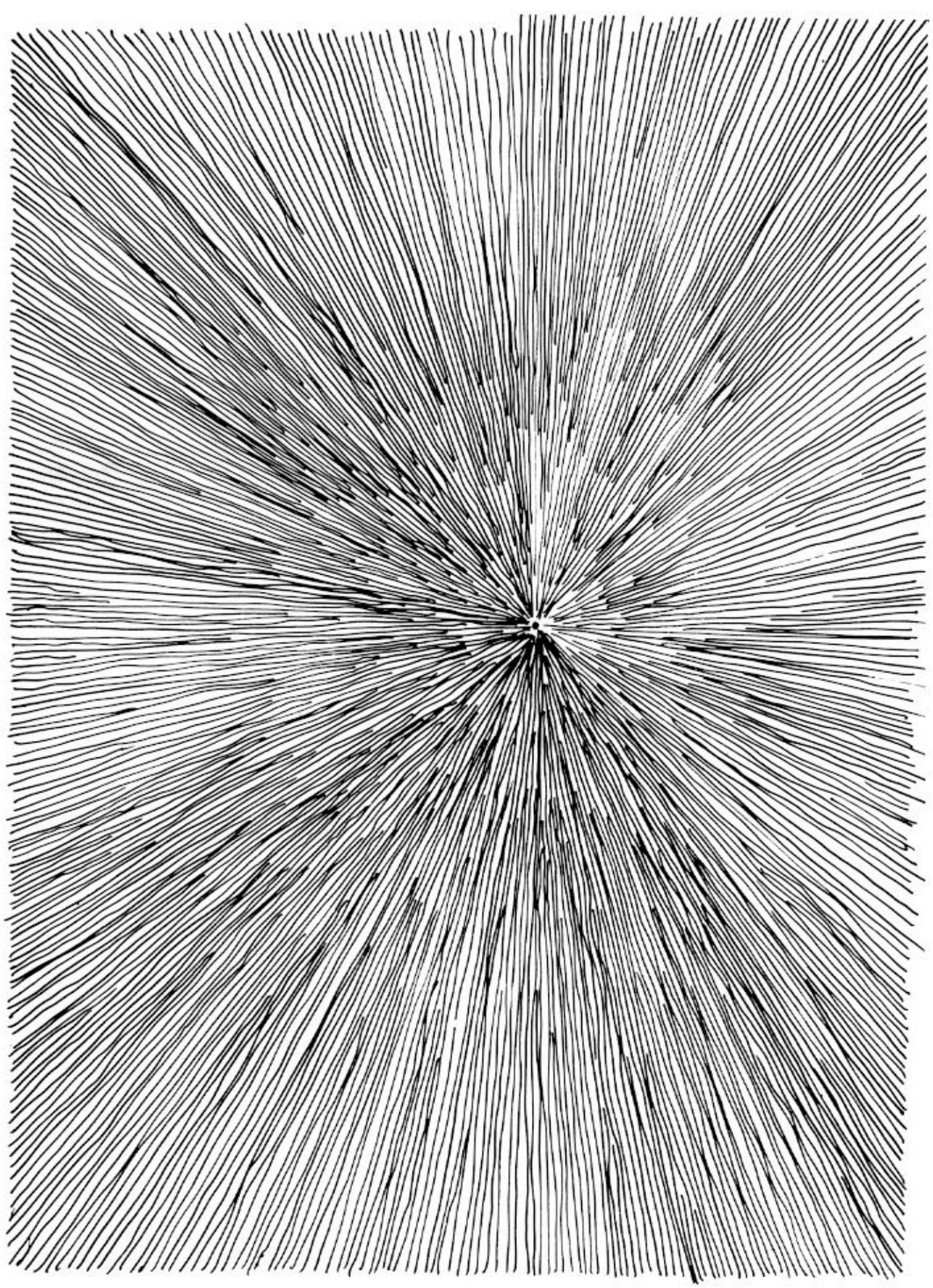
And now draw your own lines. Turn the book through 90 degrees and draw the lines right across from left to right. Here is your exercise space:

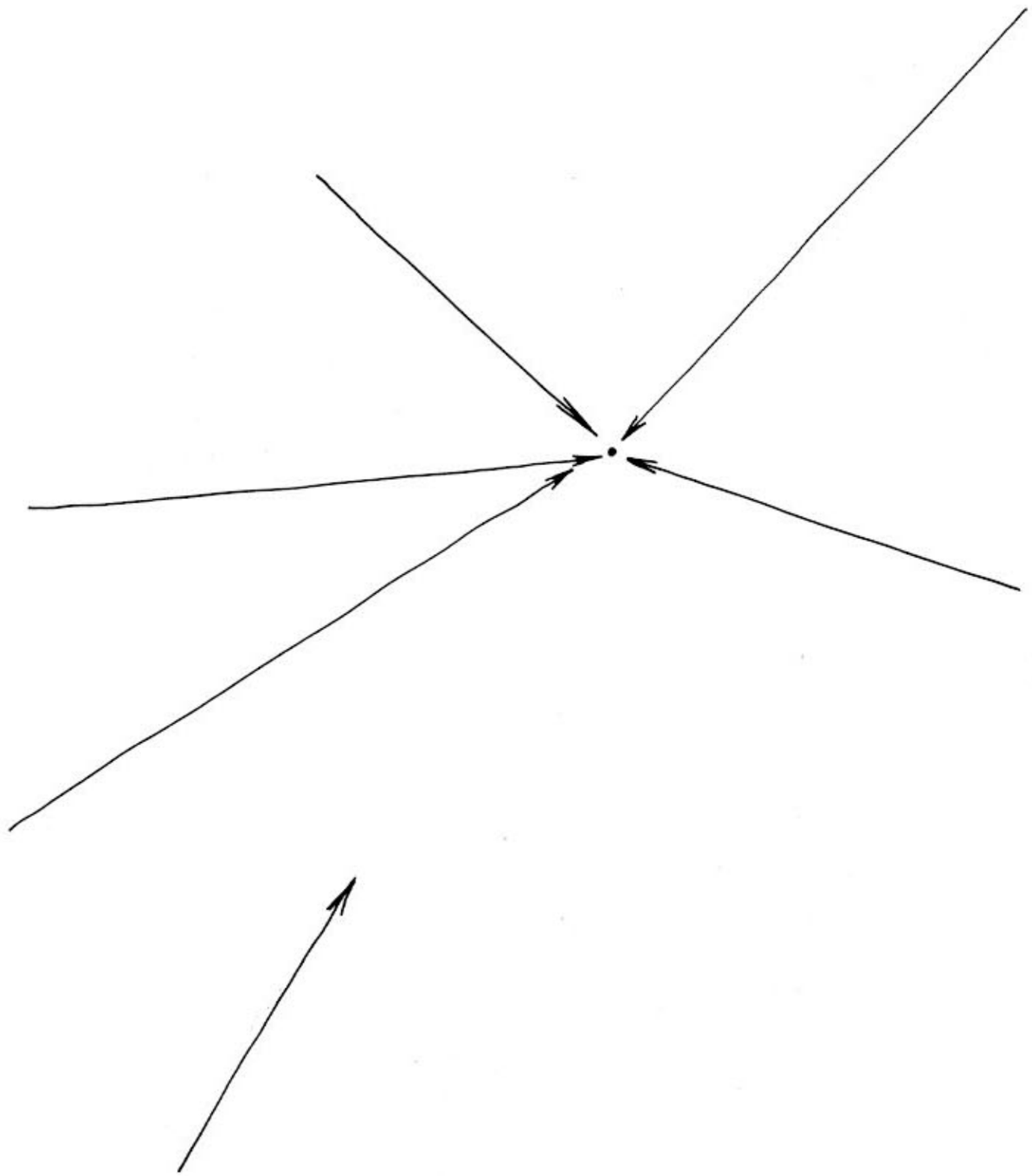
Made a mistake? Never mind. Go on with the exercise.

soon achieve the same technique as I and everyone else who has made the effort before you. Here is your exercise space:

Now for some concentration practice. The lines no longer run parallel to the edge of the page.

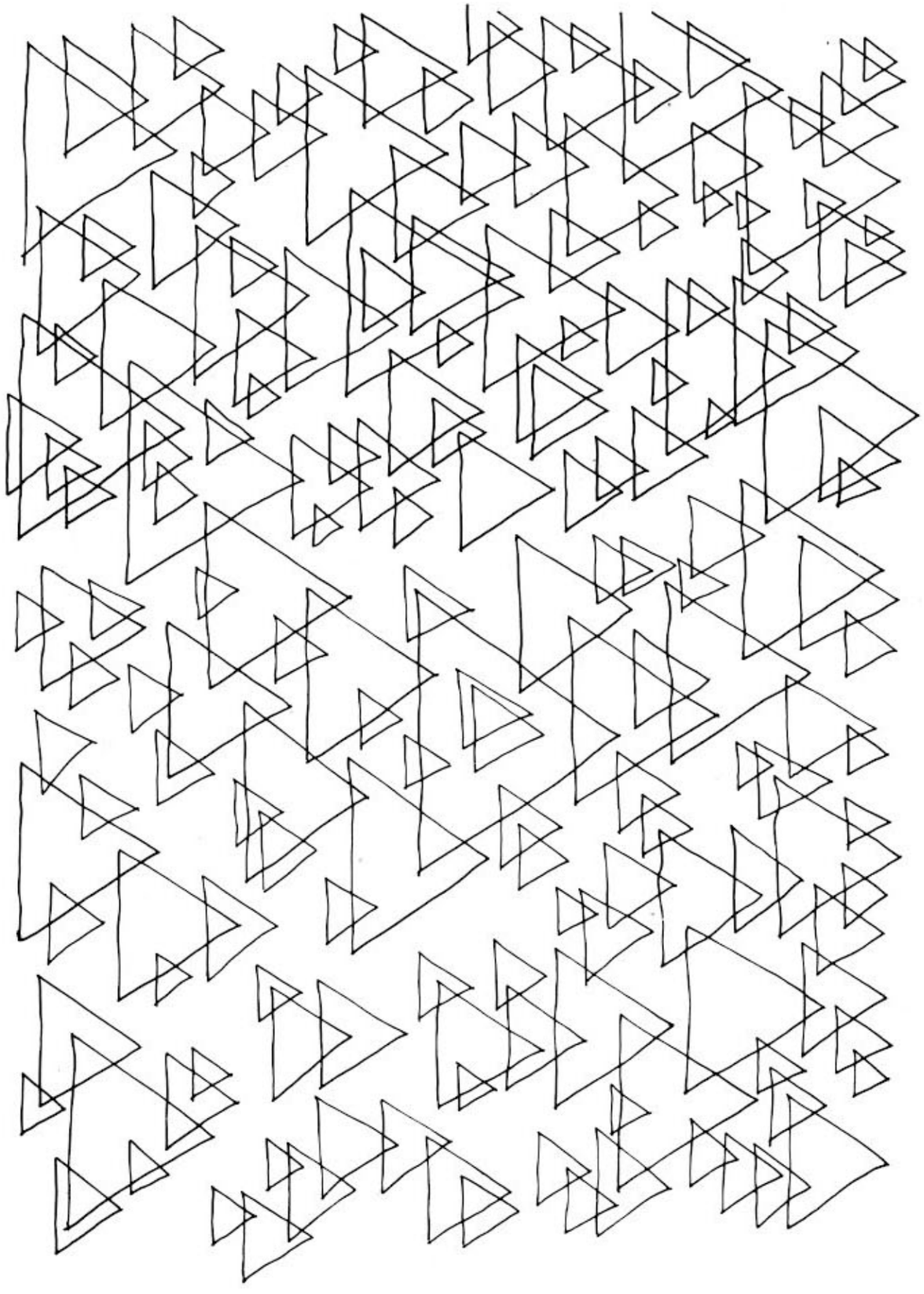
This example will test your sureness of eye and ability to maintain a given line direction. The object is to draw lines from any direction in toward the given point.

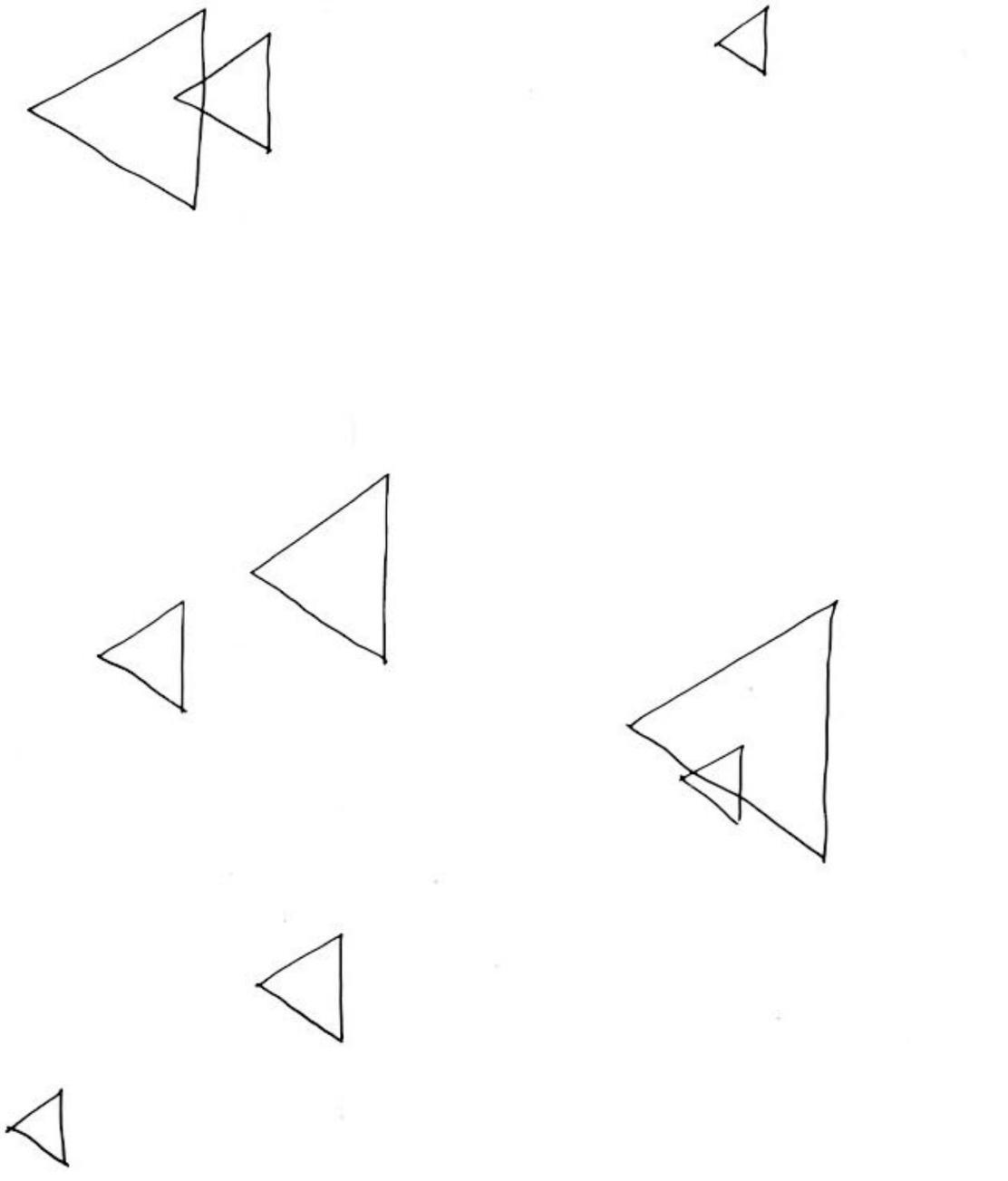




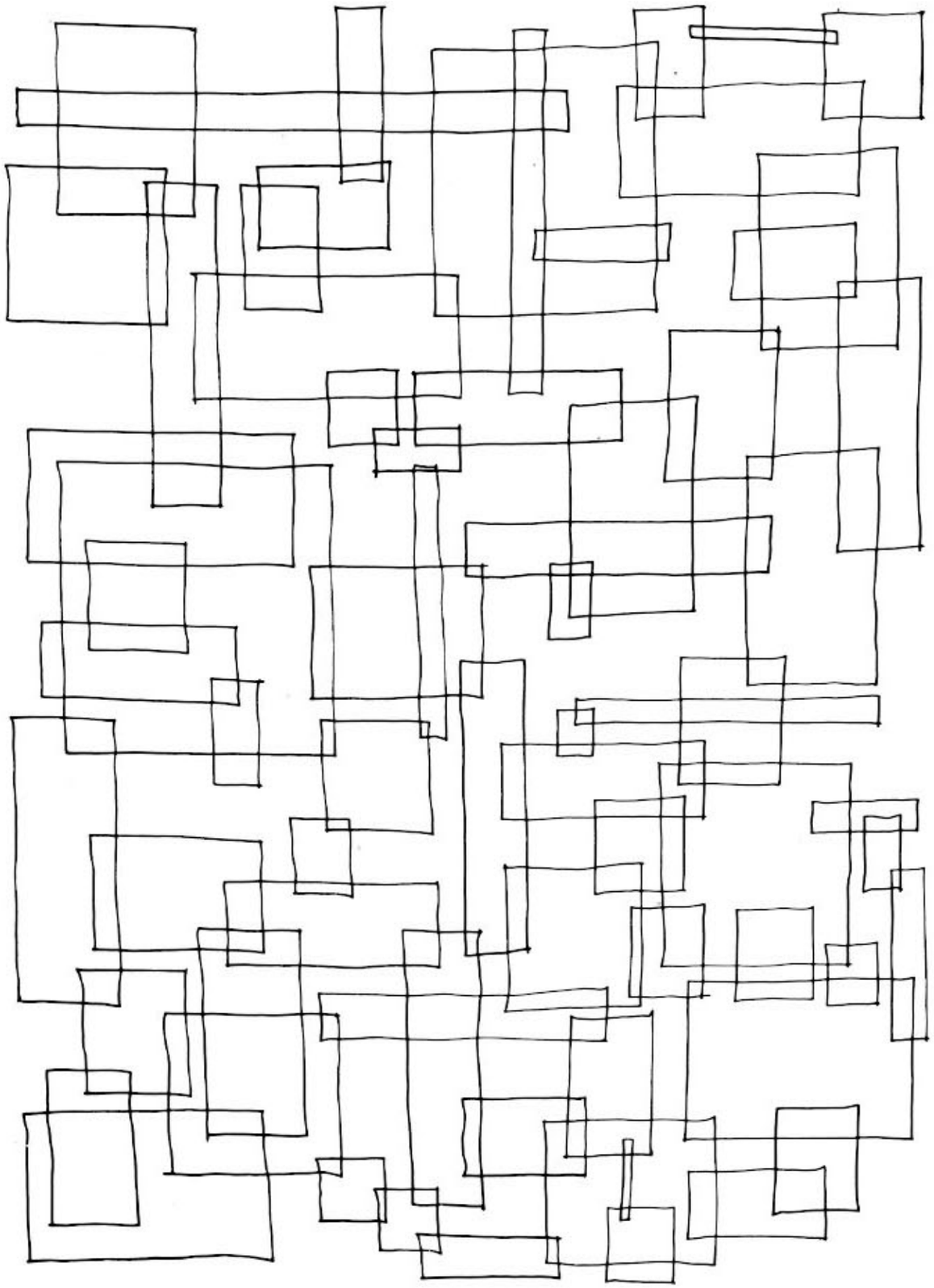
Exercise space for some more "target practice":

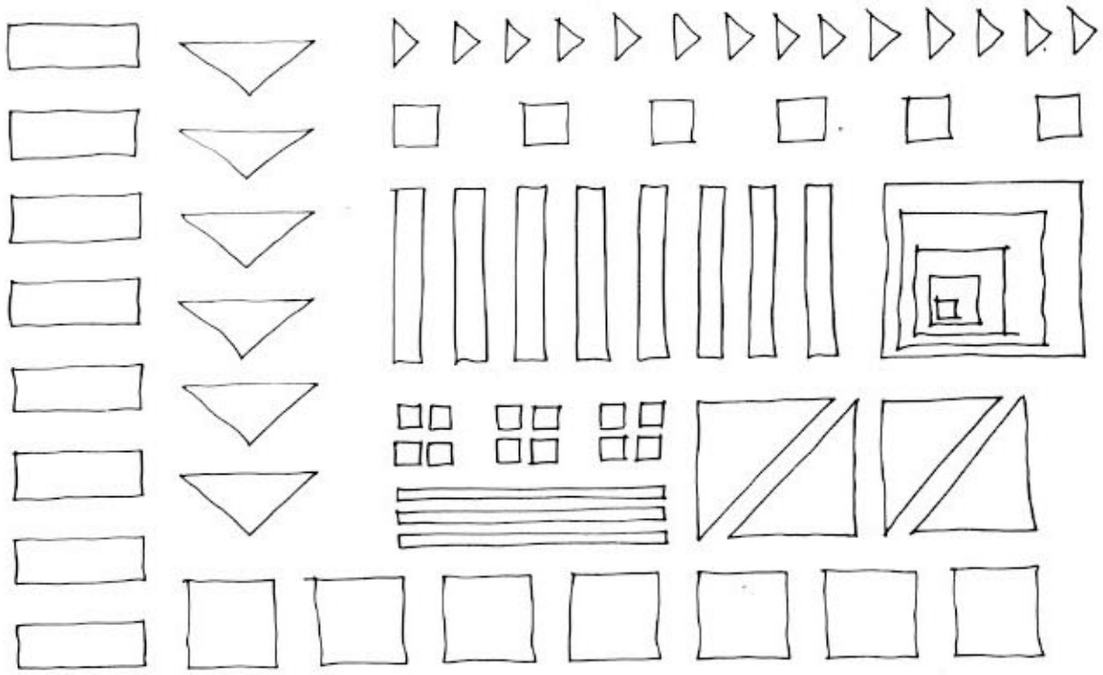
Triangles can be interlinked as well.



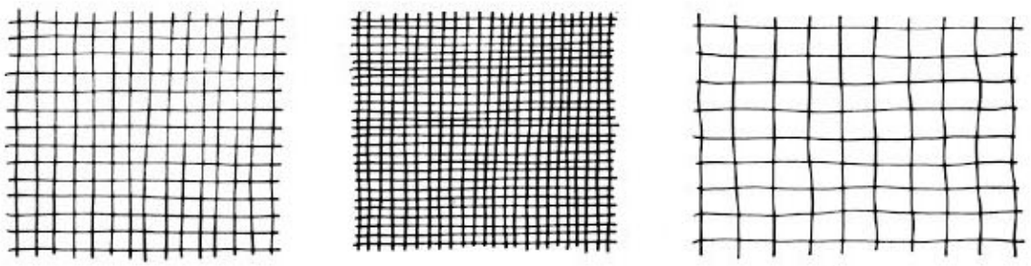


Random interlinking of rectangles. You will soon grasp the principle. Draw something similar.

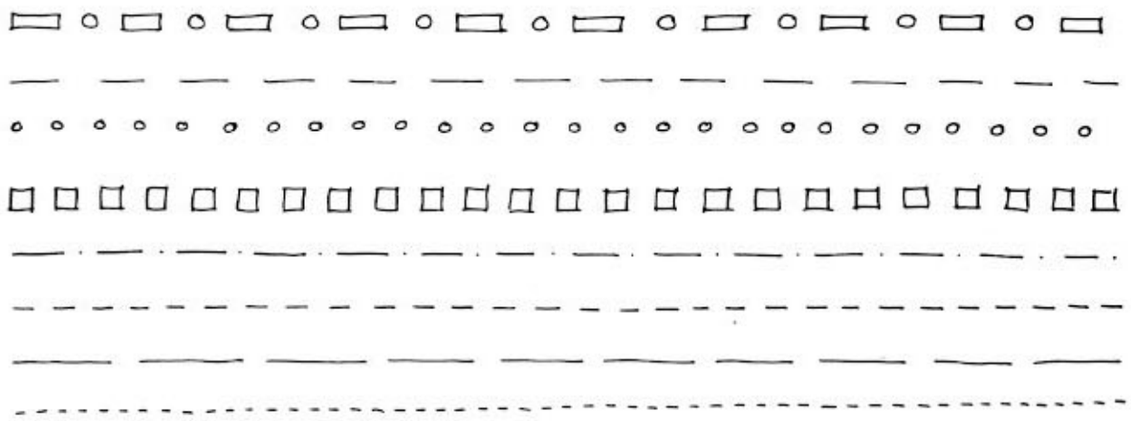




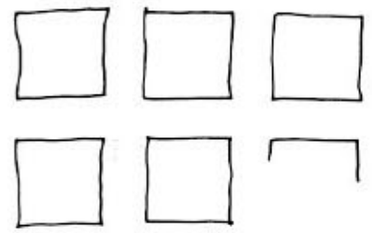
It looks so easy, doesn't it? But just try to repeat the various figures carefully and very evenly on your exercise space.

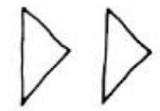


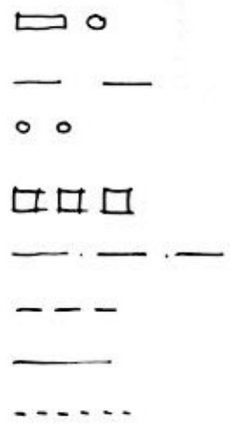
Evenness is all-important!



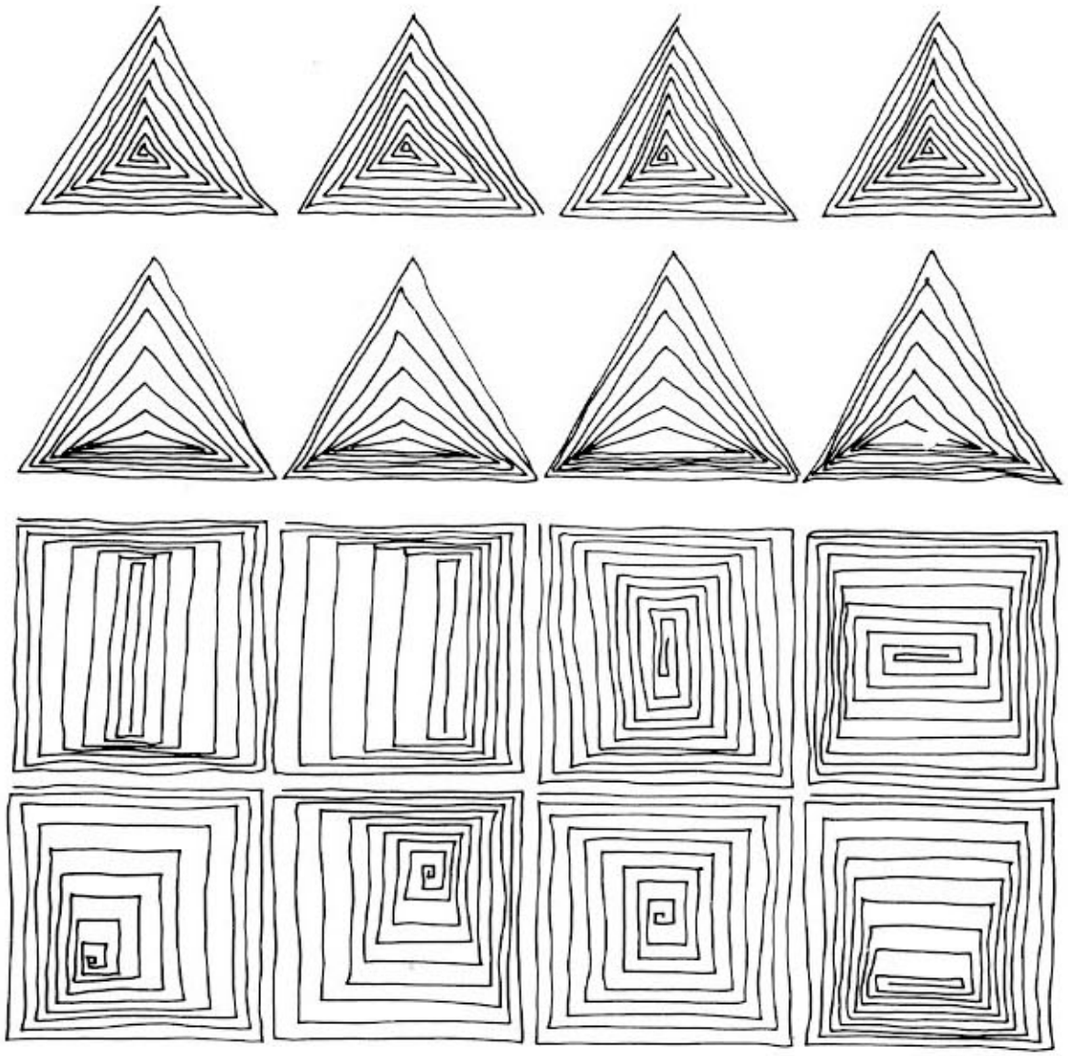
The following repeat exercises show that your eye is already capable of anticipating and visualizing the correct lines in advance.





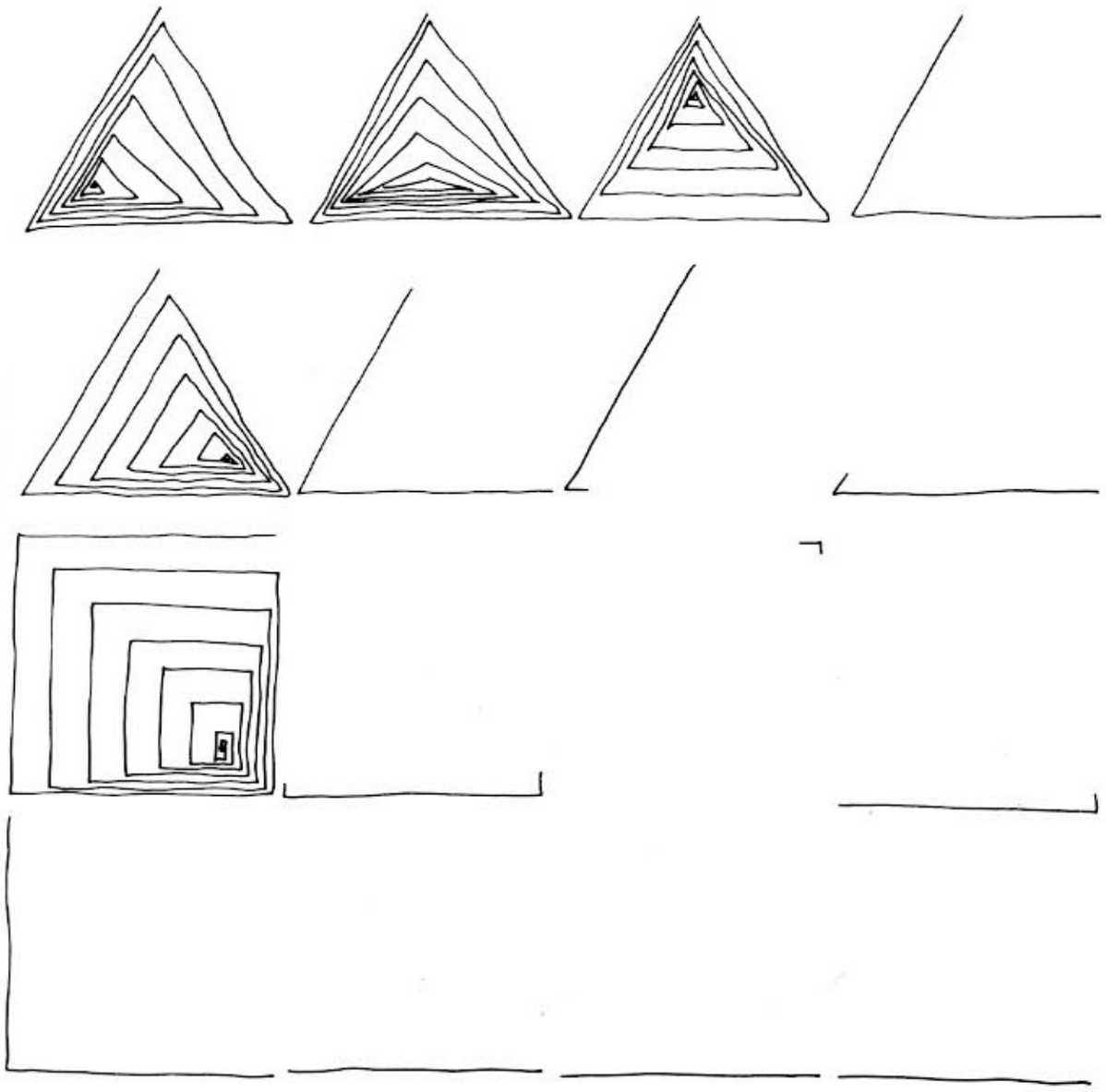


With each exercise you will become aware of the countless possible variations. Your free choice of these possibilities will now rapidly grow and will give you much enjoyment.

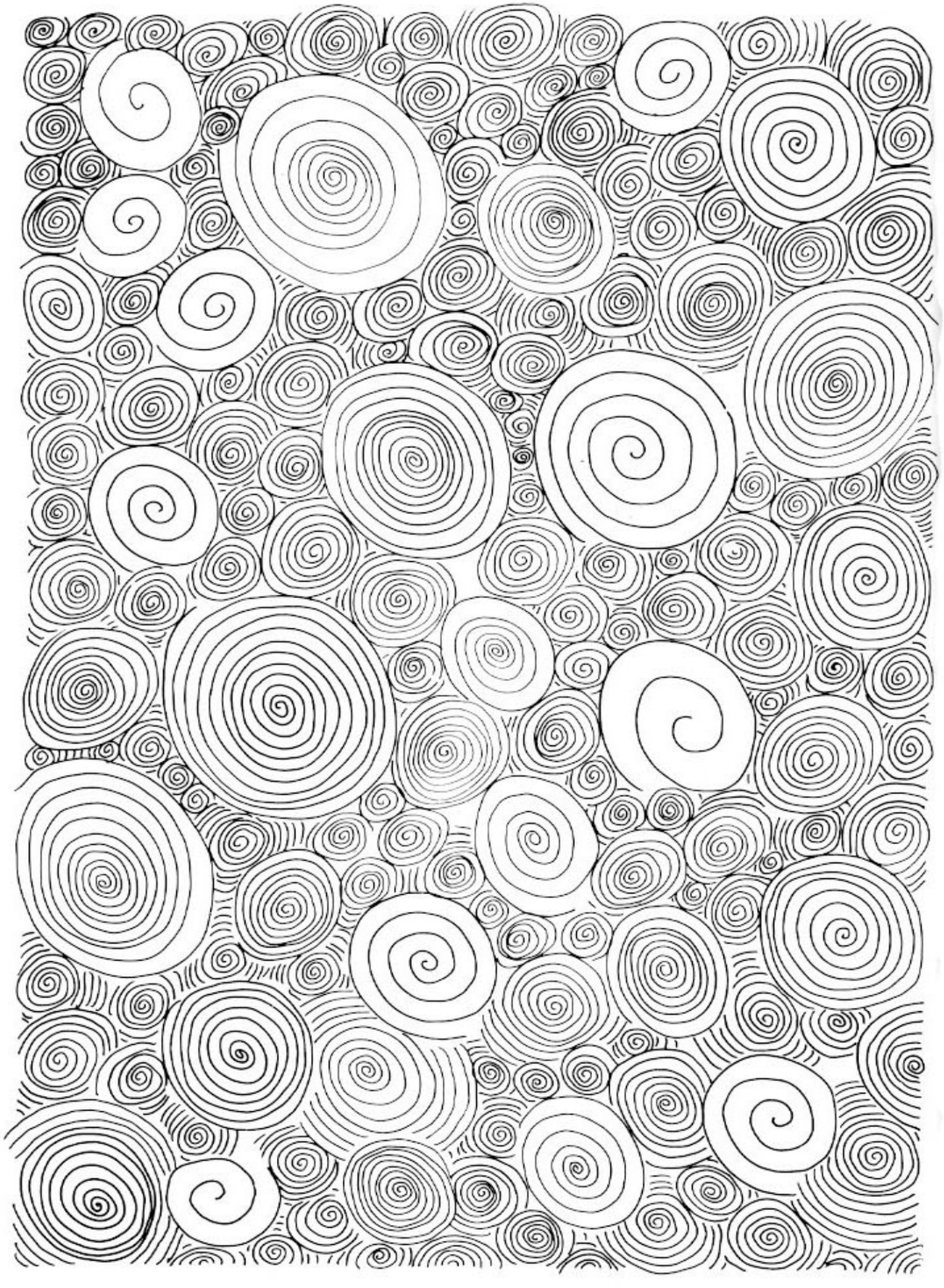


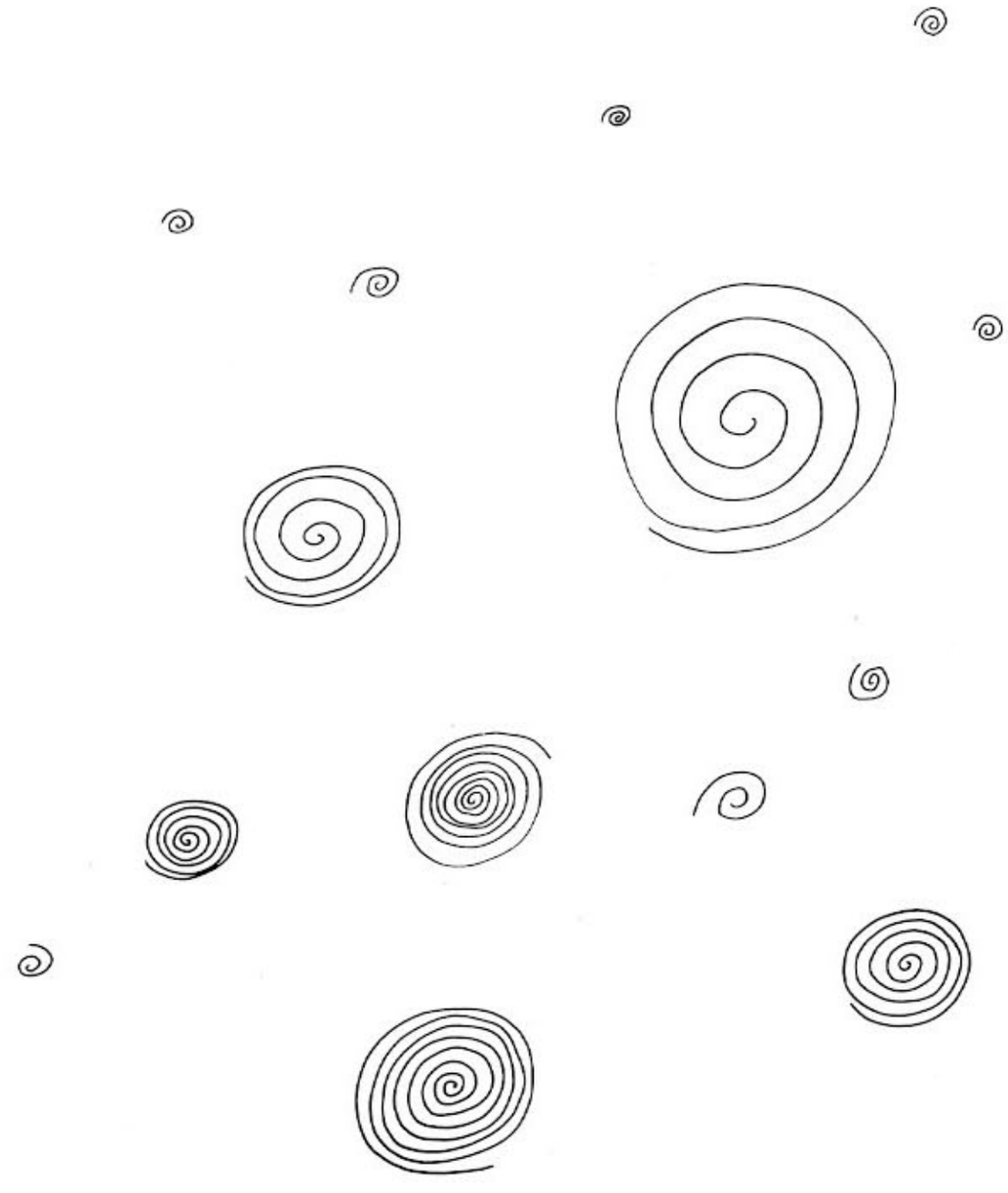
And here is some space for you to develop similar motifs on your own:

Some more exercise space:

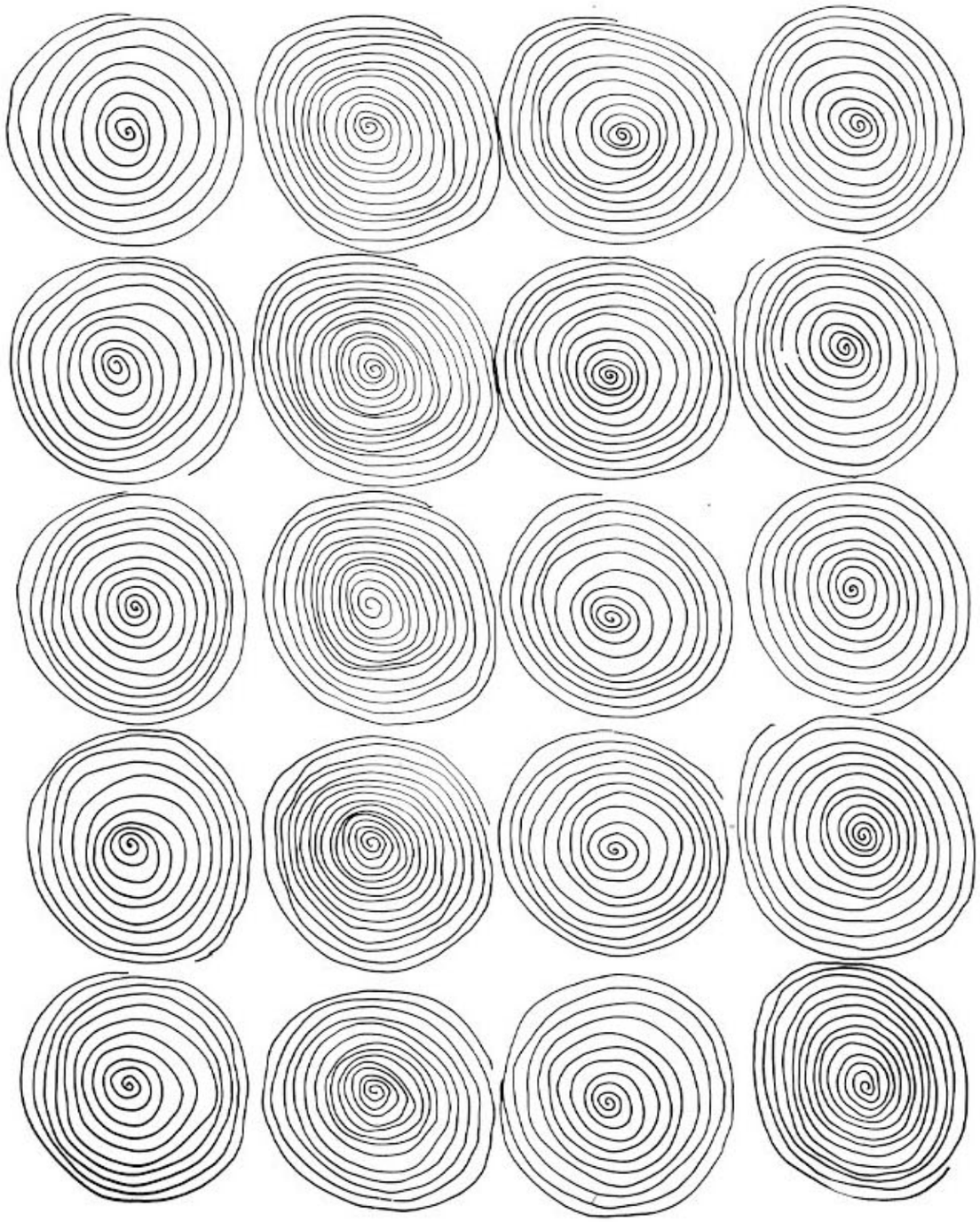


Drawing circles is best begun by drawing coils. Start in the center and draw both clockwise and counterclockwise in tight spirals.

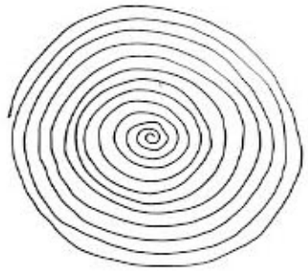


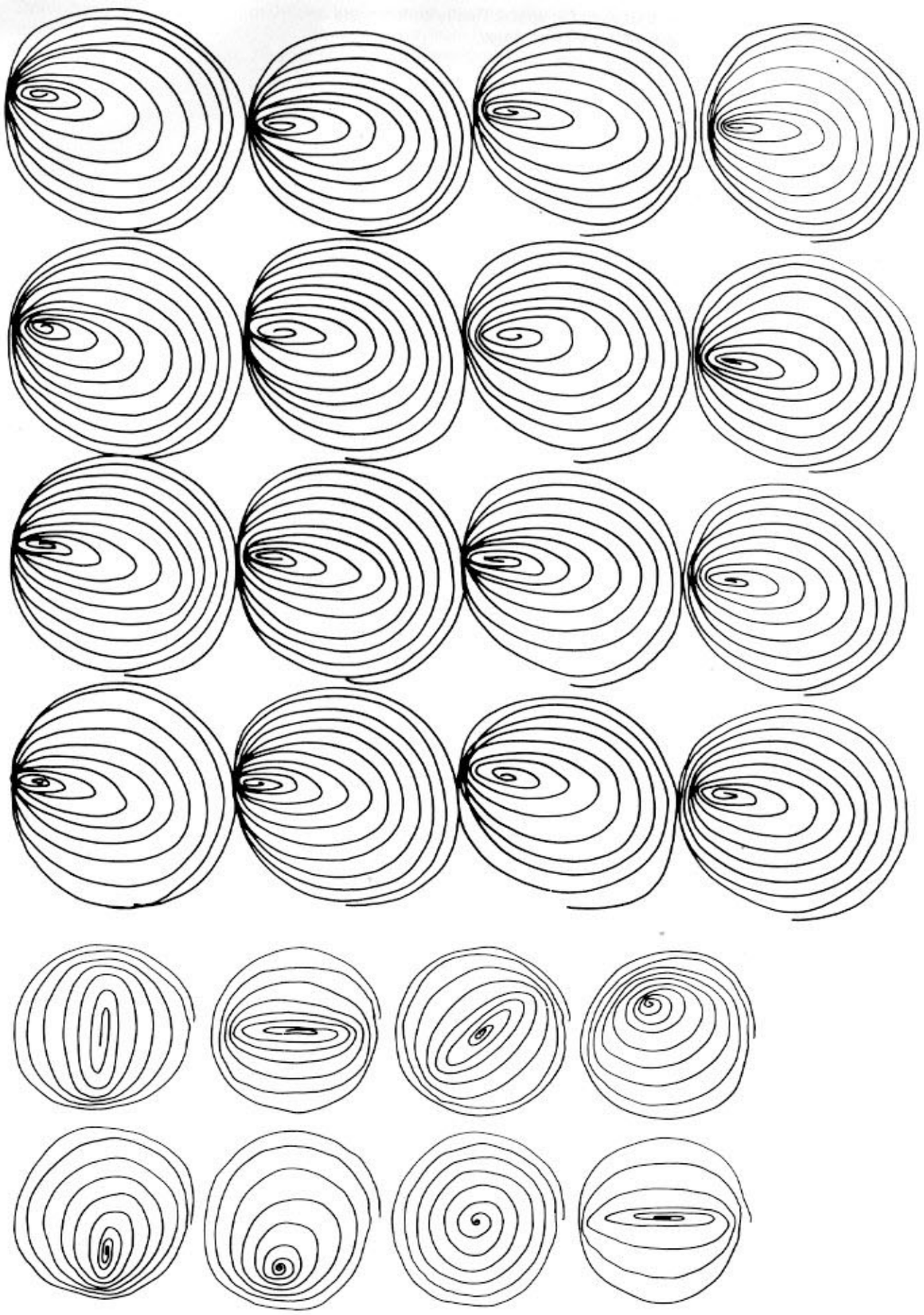


Draw the spirals clockwise, then counterclockwise, resting forearm on the board and making circular motions with the wrist; start from the center, then from the outside in. You will see that the last spirals are better than the ones you drew first.

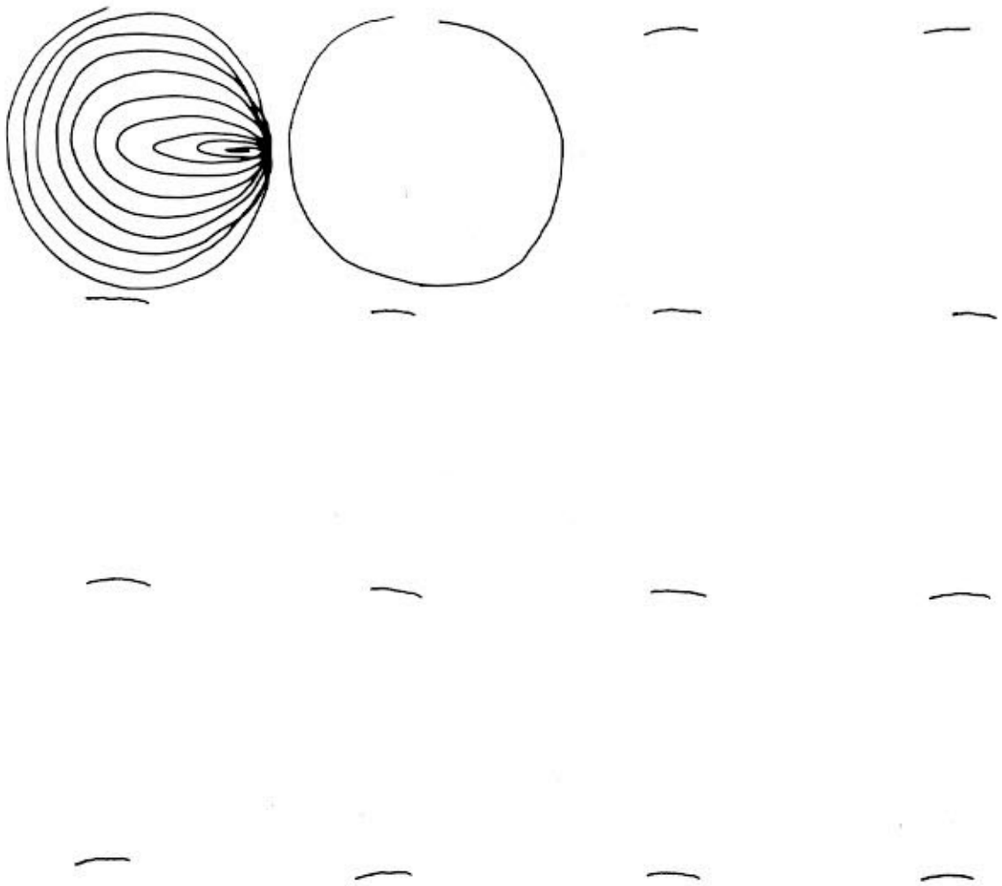


Now draw your own spirals in this exercise space. Really concentrate and try to see the finished spiral on paper—then start to draw.

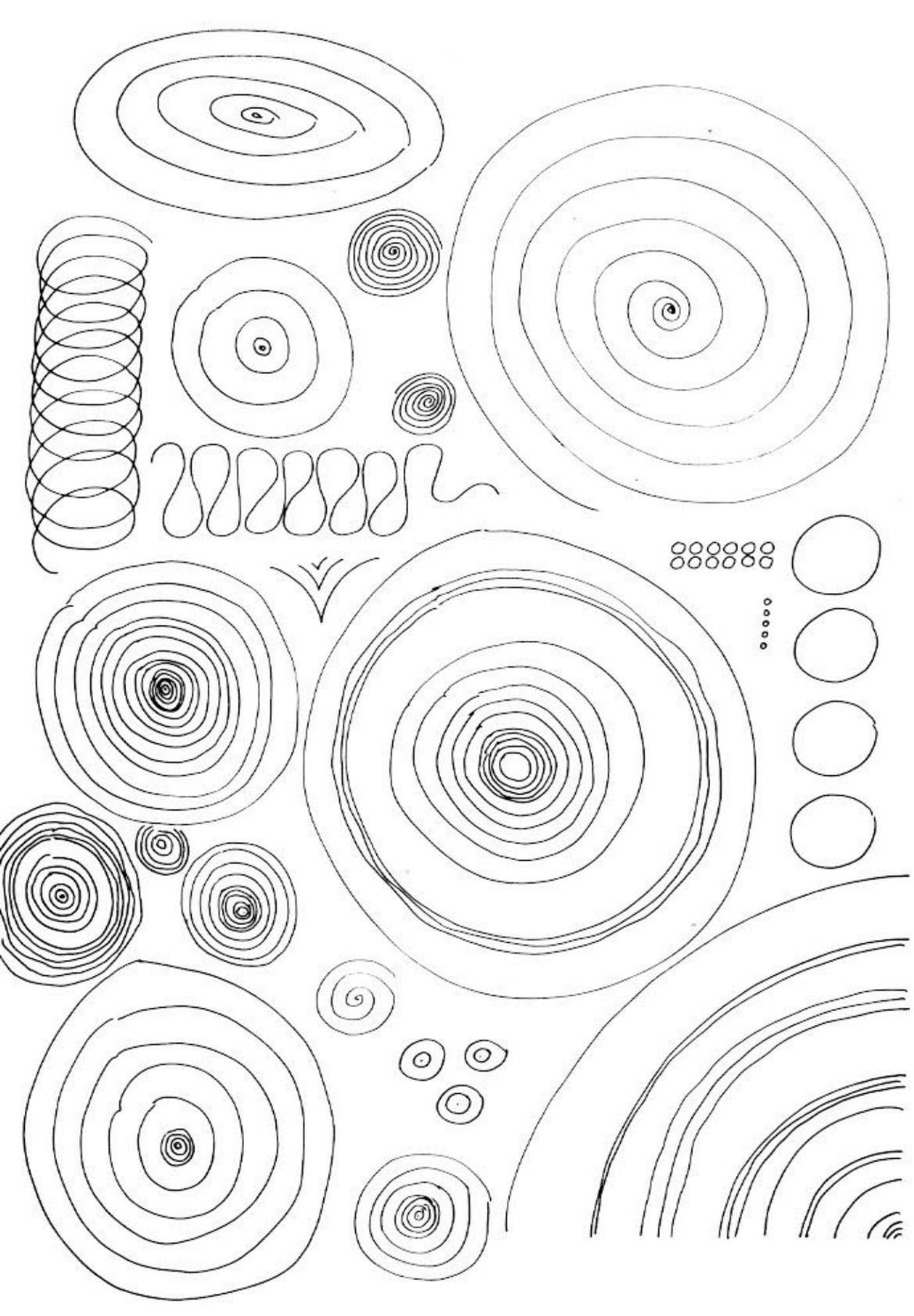


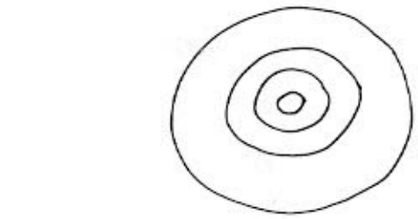


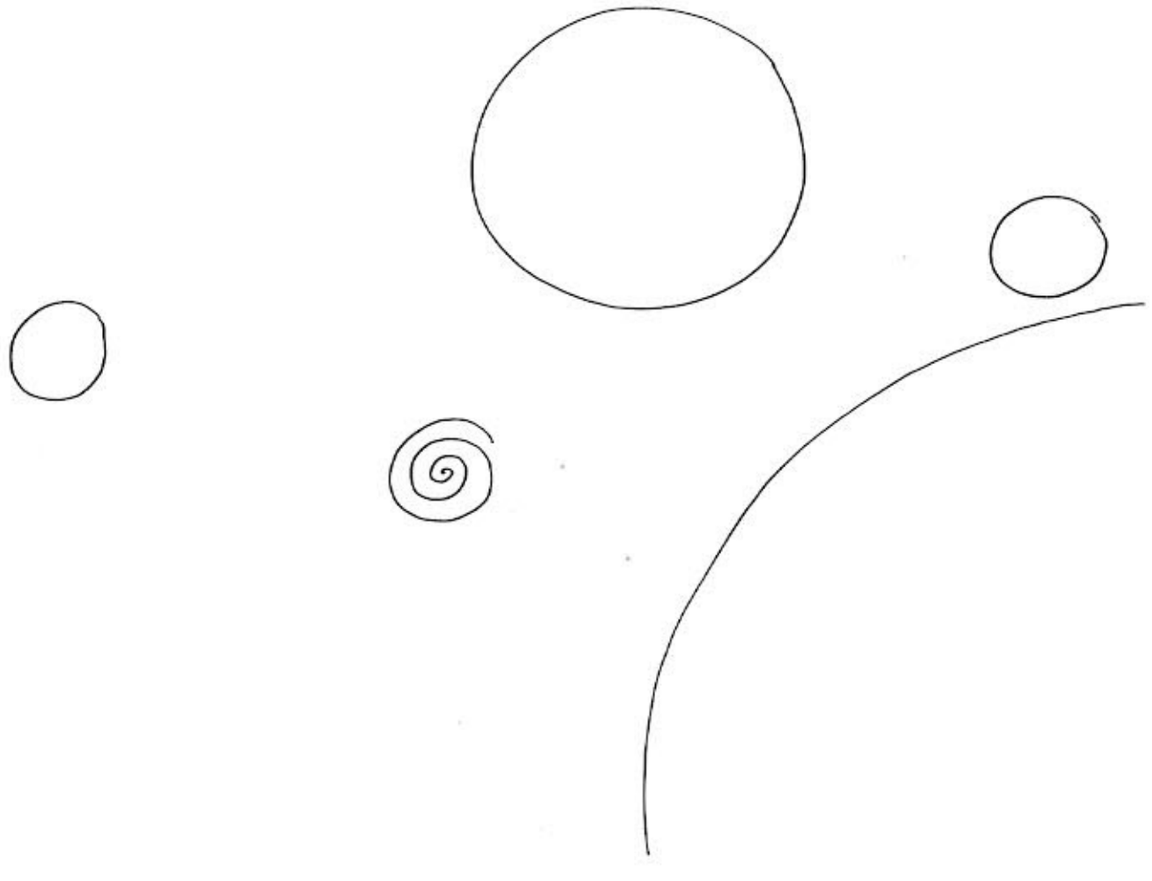
This time, the spirals have their centers displaced to one side. You will soon see that it is not so difficult to do as it seems. Exercise space (start from the outside):

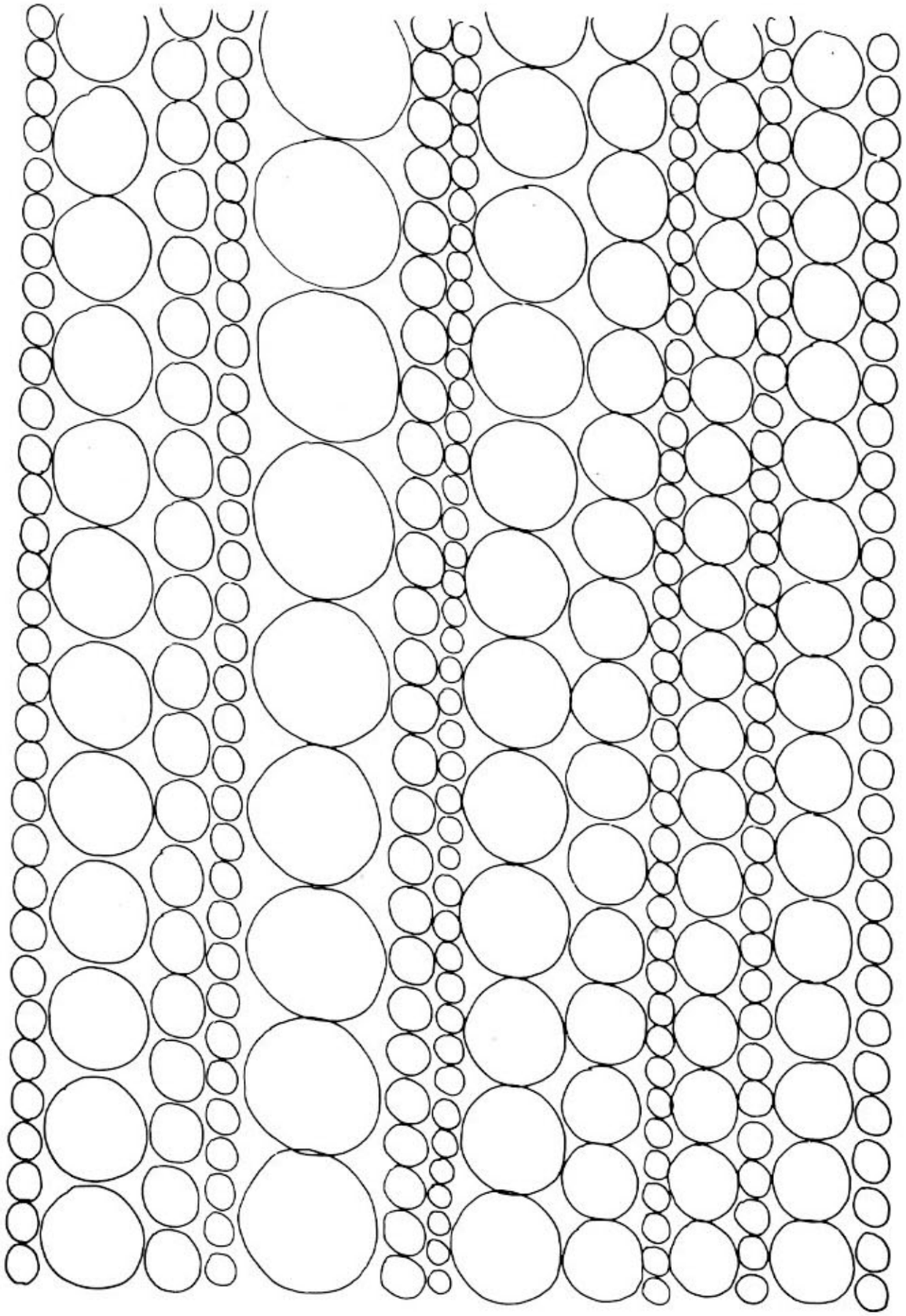


Rest your drawing hand on the paper and start to draw the circles freely. Once you get through this difficult exercise you will achieve a big step further. Exercise space:

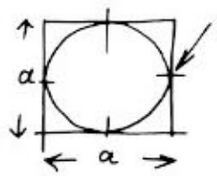








You should now be able to draw circles relatively easily. A circle can be thought of as being enclosed inside a square, each quarter of which contains a quarter of the curve of the circle. Points of contact are very brief. We can start by drawing a theoretical hemisphere which is then completed to form the whole sphere (circle).



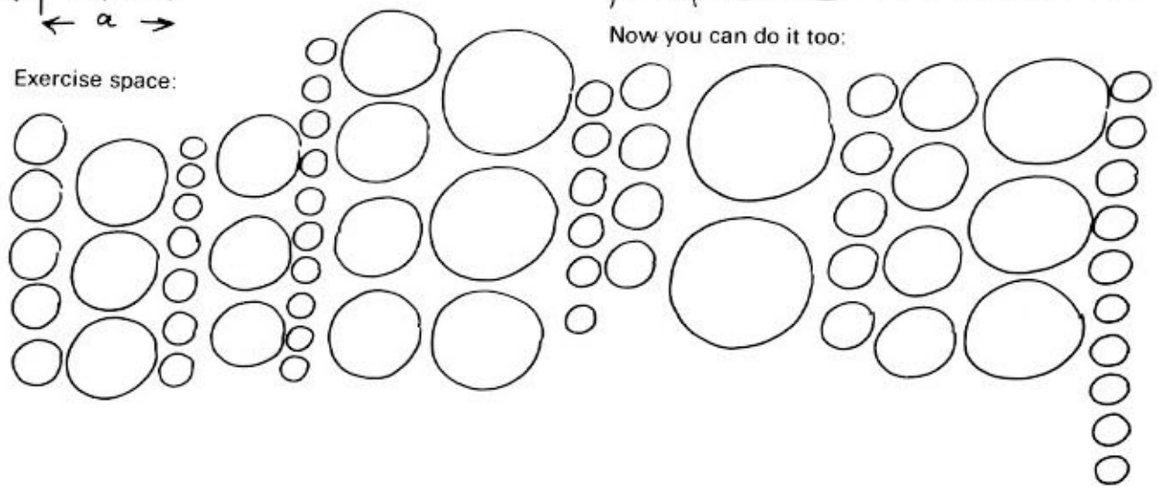
minimal contact

stroke starts here

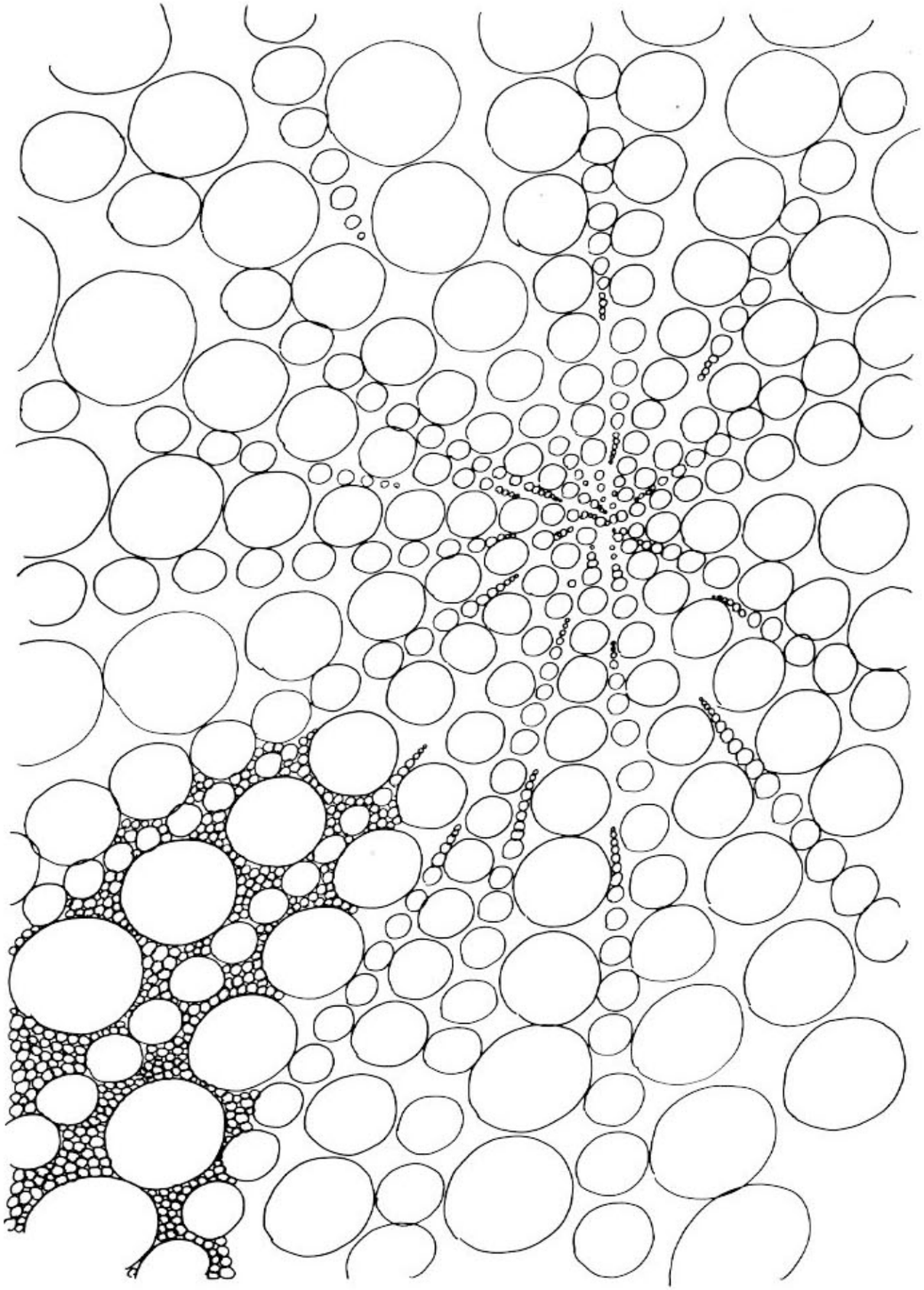
We start to draw:

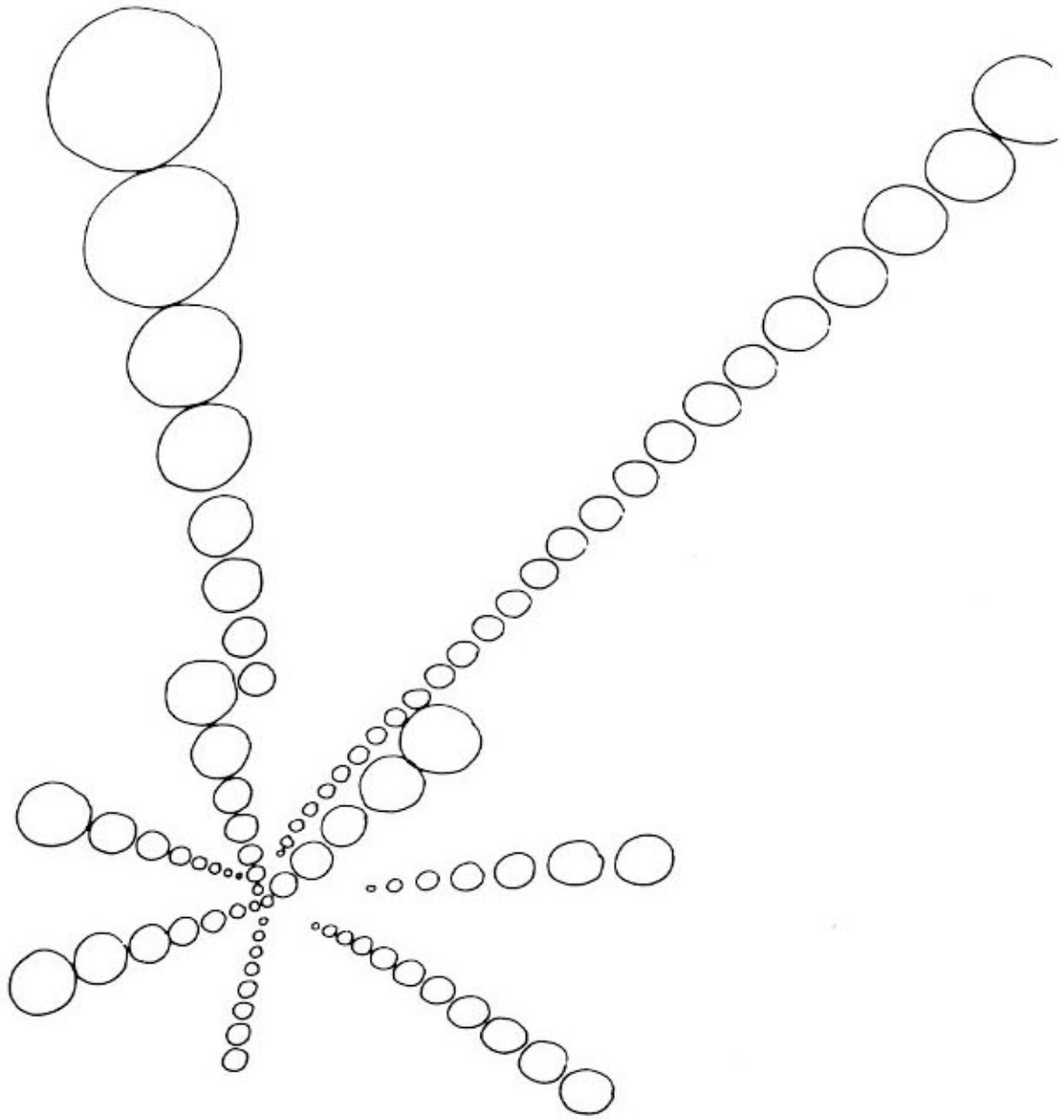
Now you can do it too:

Exercise space:



Yes, the degree of difficulty is growing—but then so is your confidence!

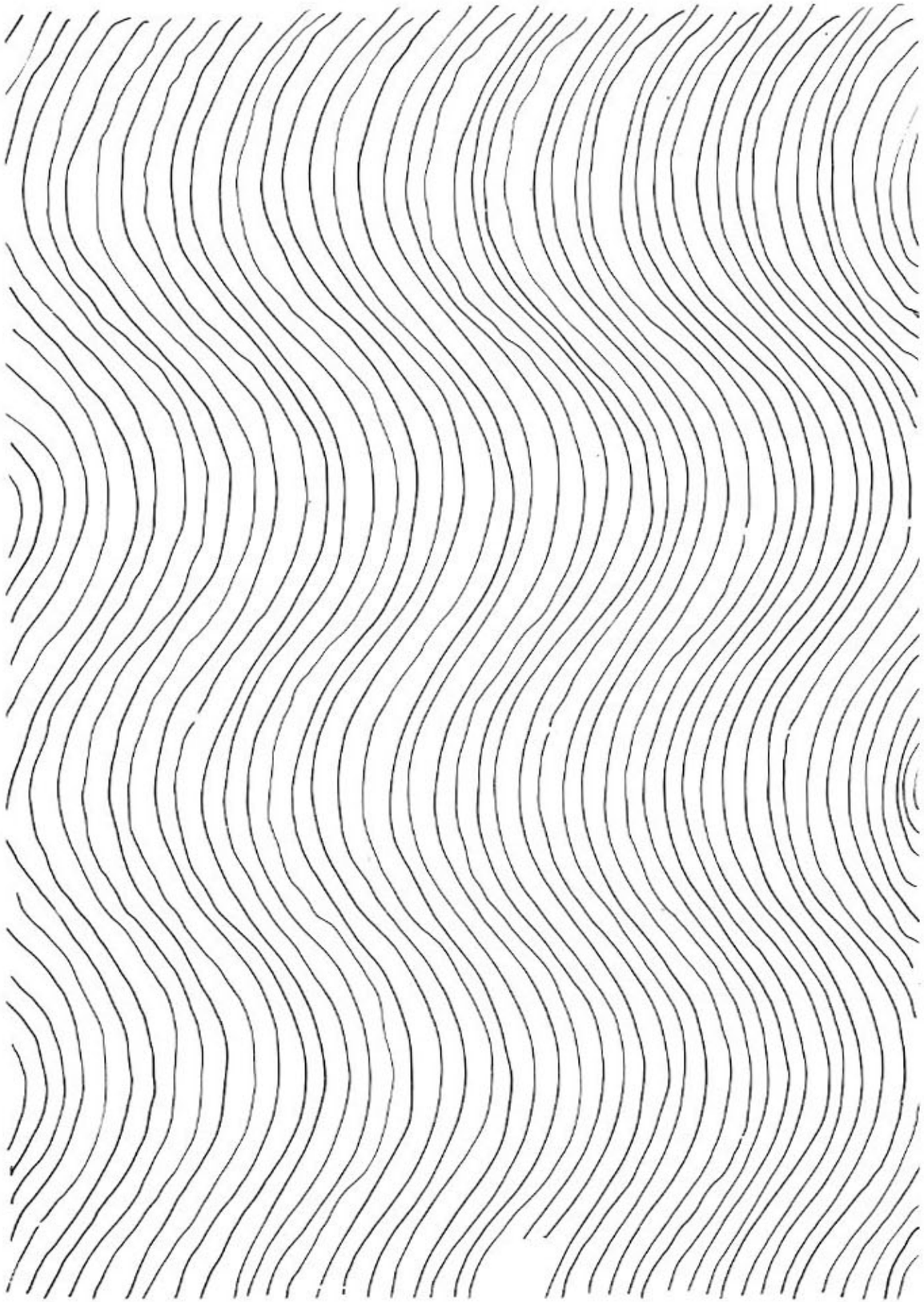


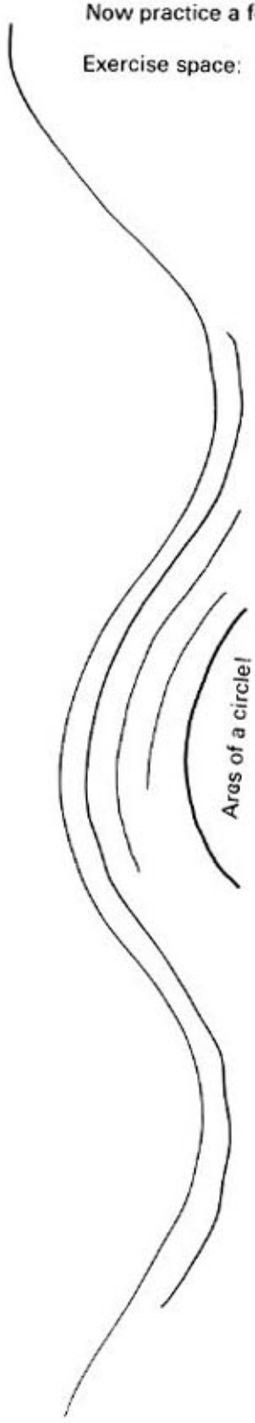


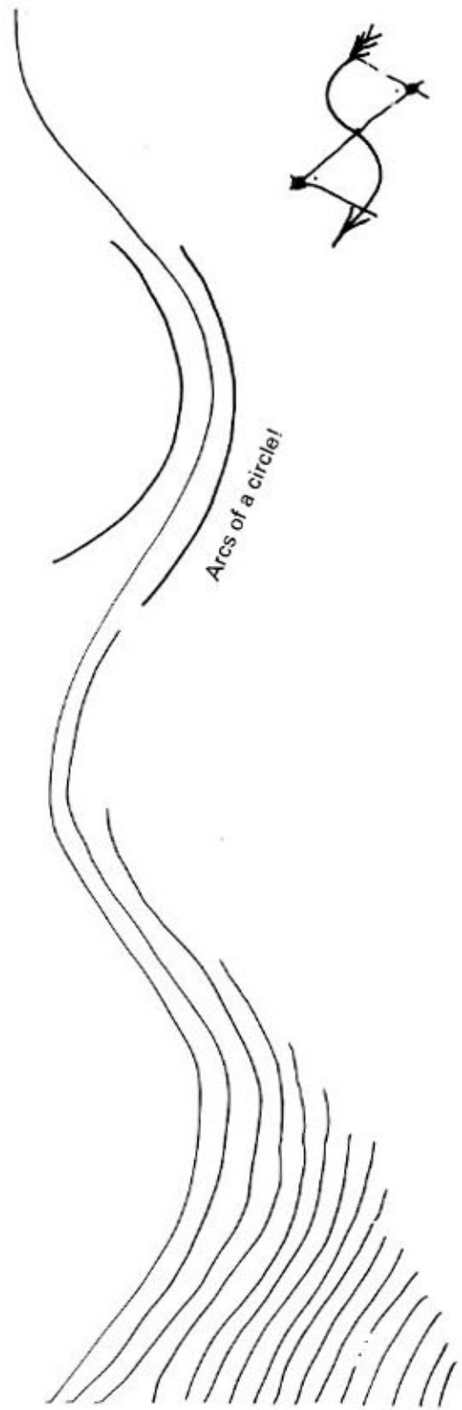
By now you have had so much practice that each and every stroke will be exactly where you want it to go.

Now practice a few wavy lines.

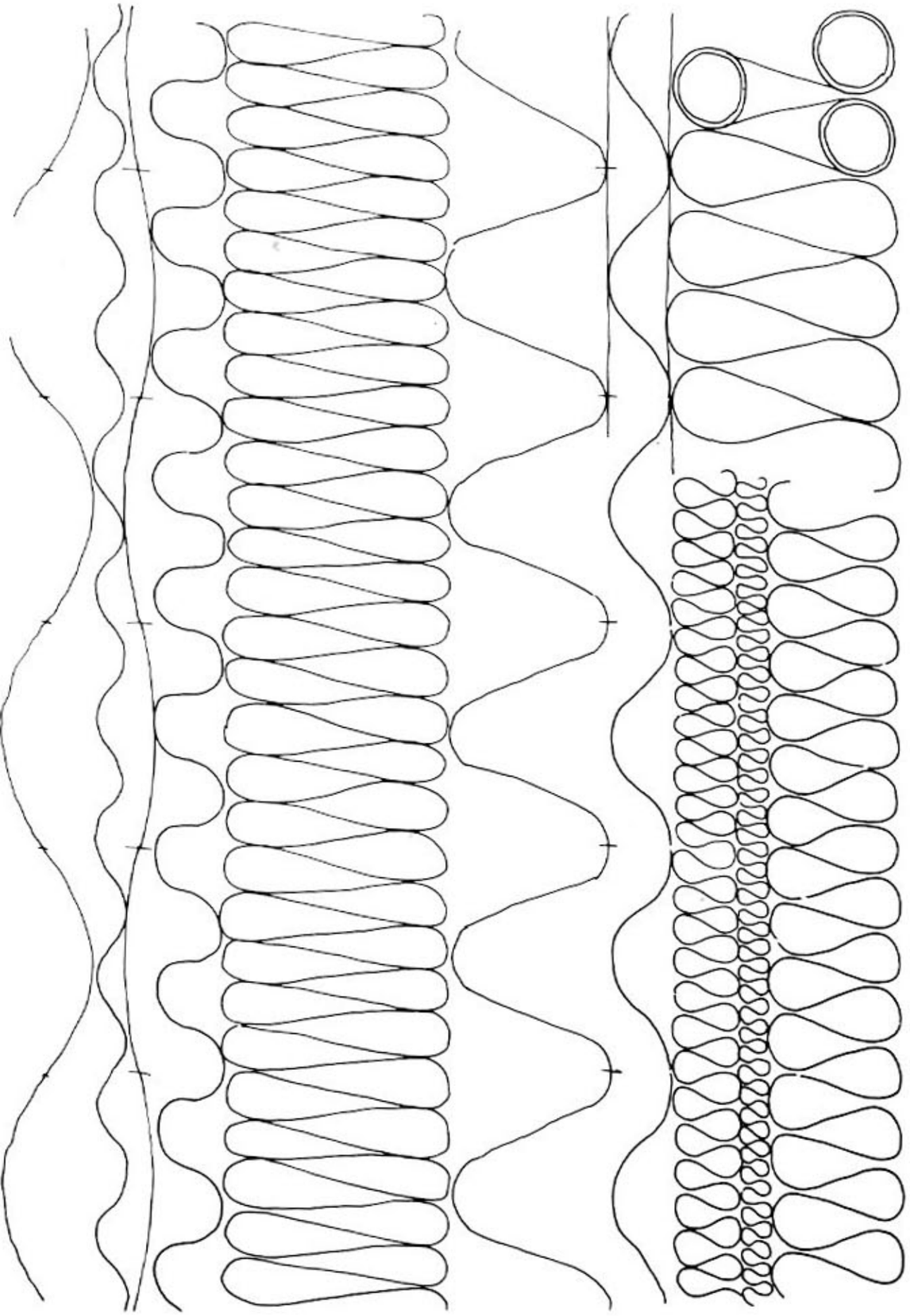
Exercise space:

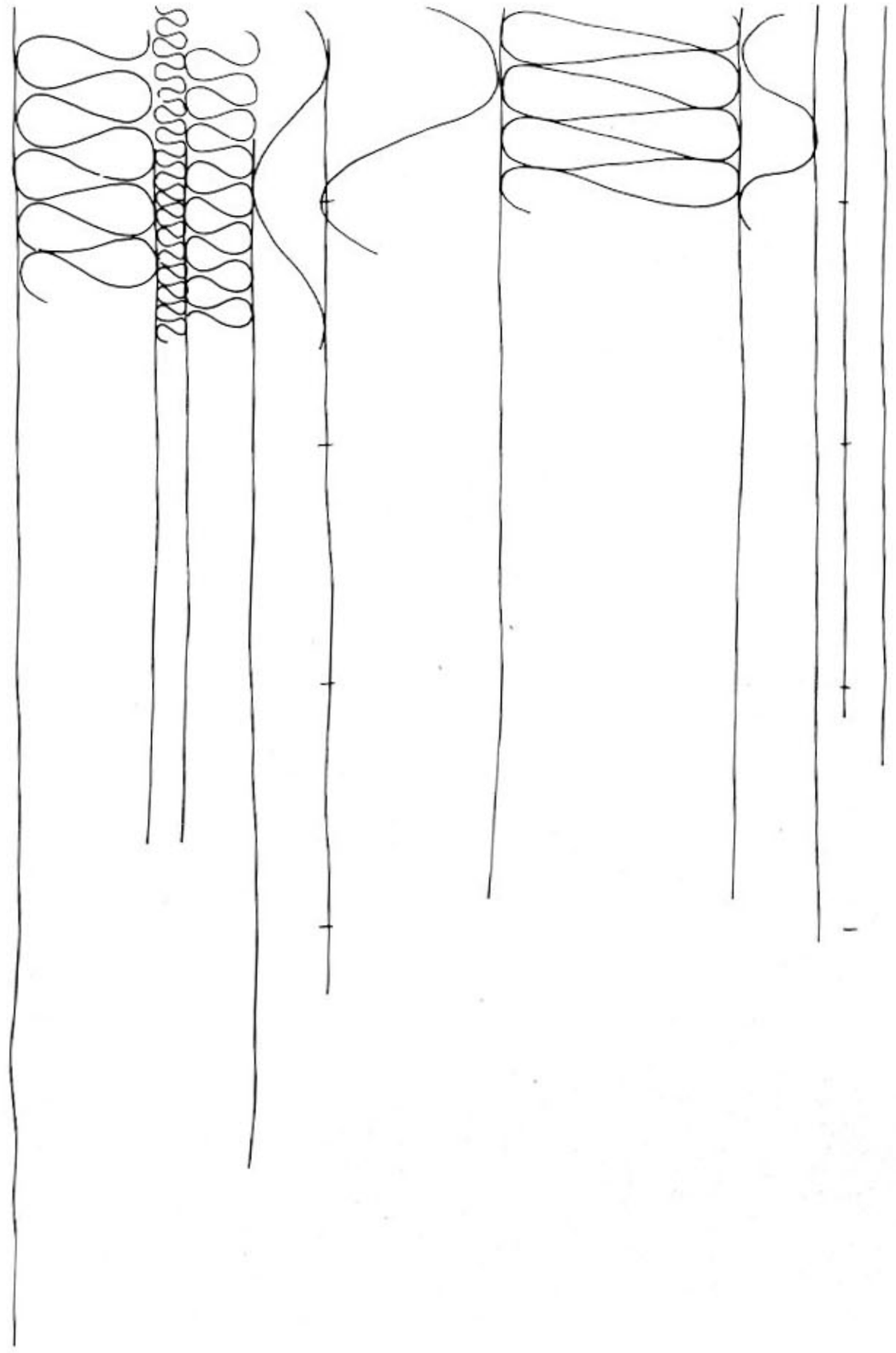




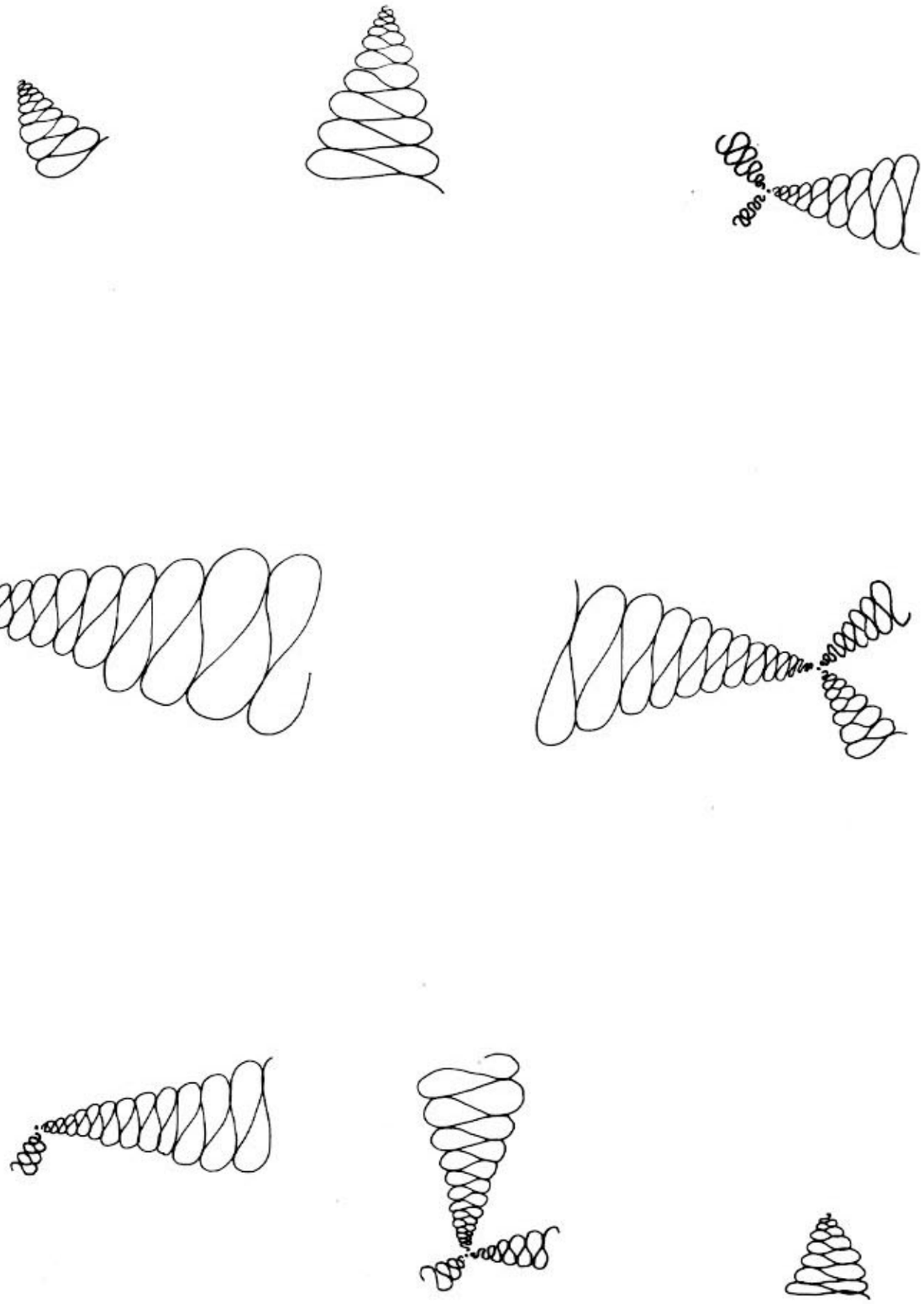


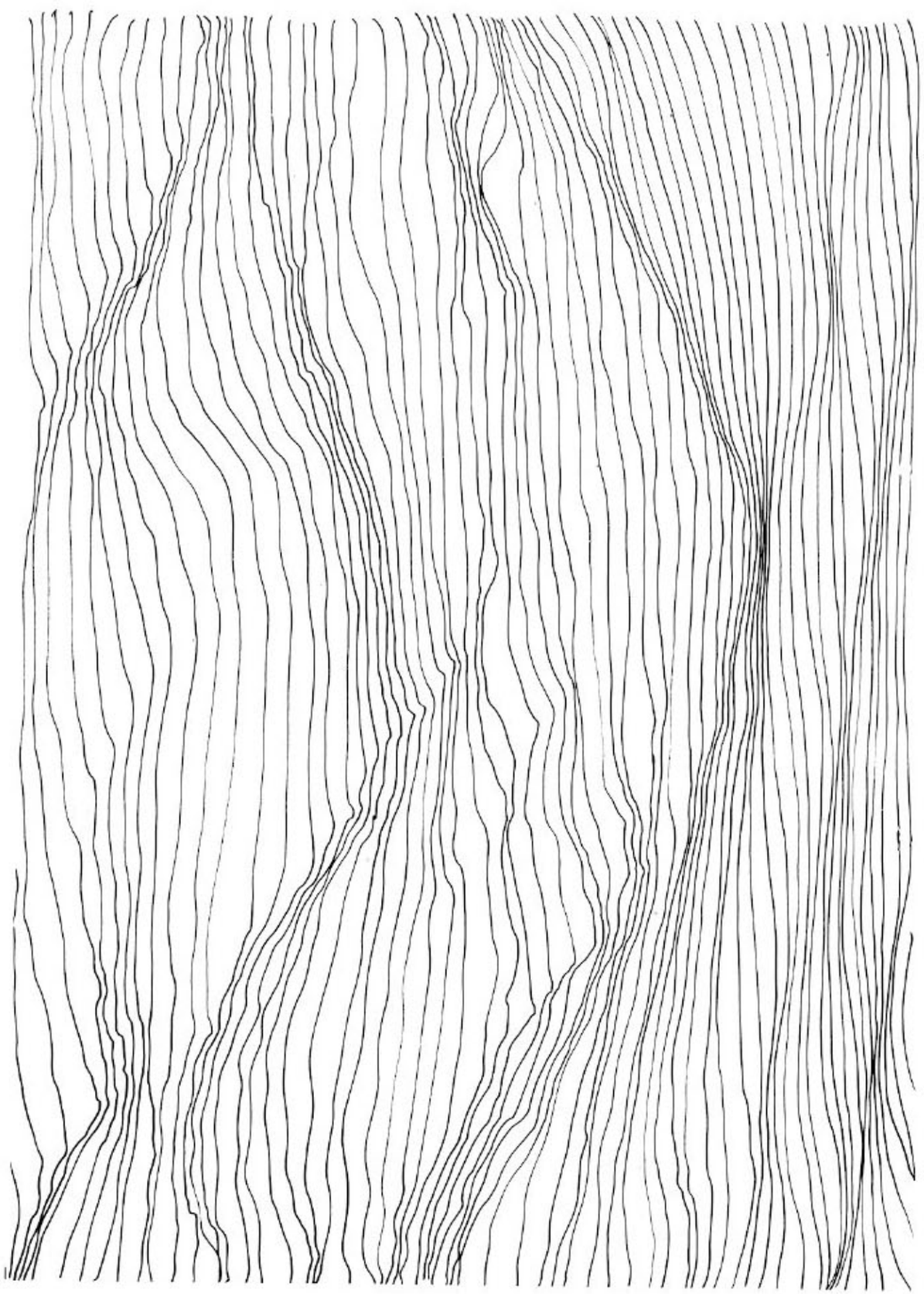
A few suggestions for practicing wavy lines:



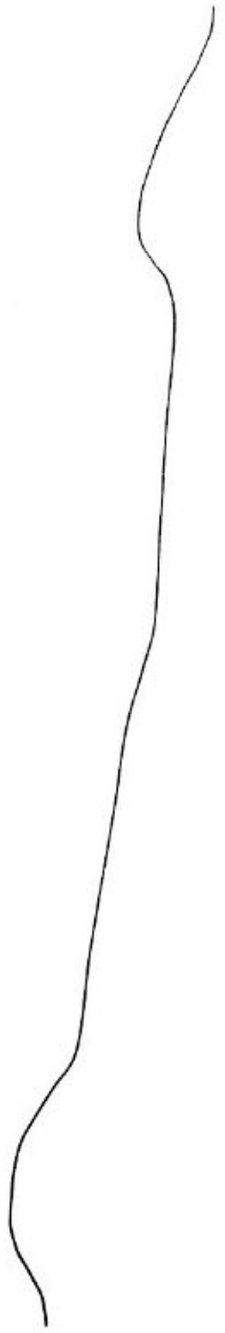


Exercise space for more variations on the wavy-line theme:

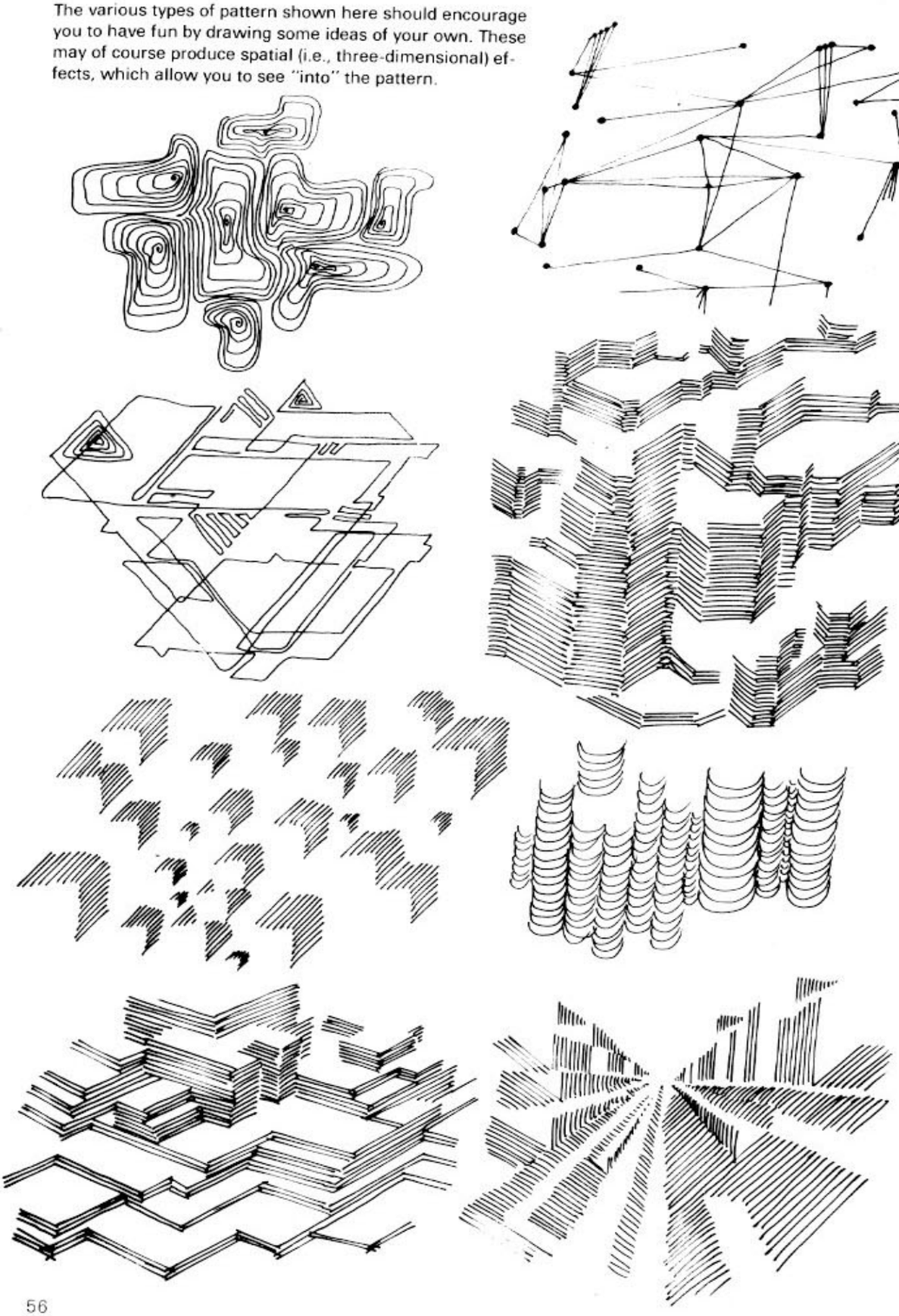




And finally, try to draw lines similar to those shown on the opposite page.
Please note all characteristic features before putting pencil to paper!



The various types of pattern shown here should encourage you to have fun by drawing some ideas of your own. These may of course produce spatial (i.e., three-dimensional) effects, which allow you to see "into" the pattern.



4.0 Drawing Surfaces and Areas

4.1 Area Infills

The simplest way to draw an area as a coherent unit is by hatching (or alternatively by the use of black/white or color contrast with the background tone). We must remember however that hatching can very rapidly become untypical for the drawn object, giving an abstract impression. The intensity of the shading must therefore be in harmony with the area's meaning. With increasing darkness, for instance, we interpret greater weight, etc. Hatching is normally used at places where other devices or representations of the material's quality are unacceptable because of prohibitive effort or complexity.

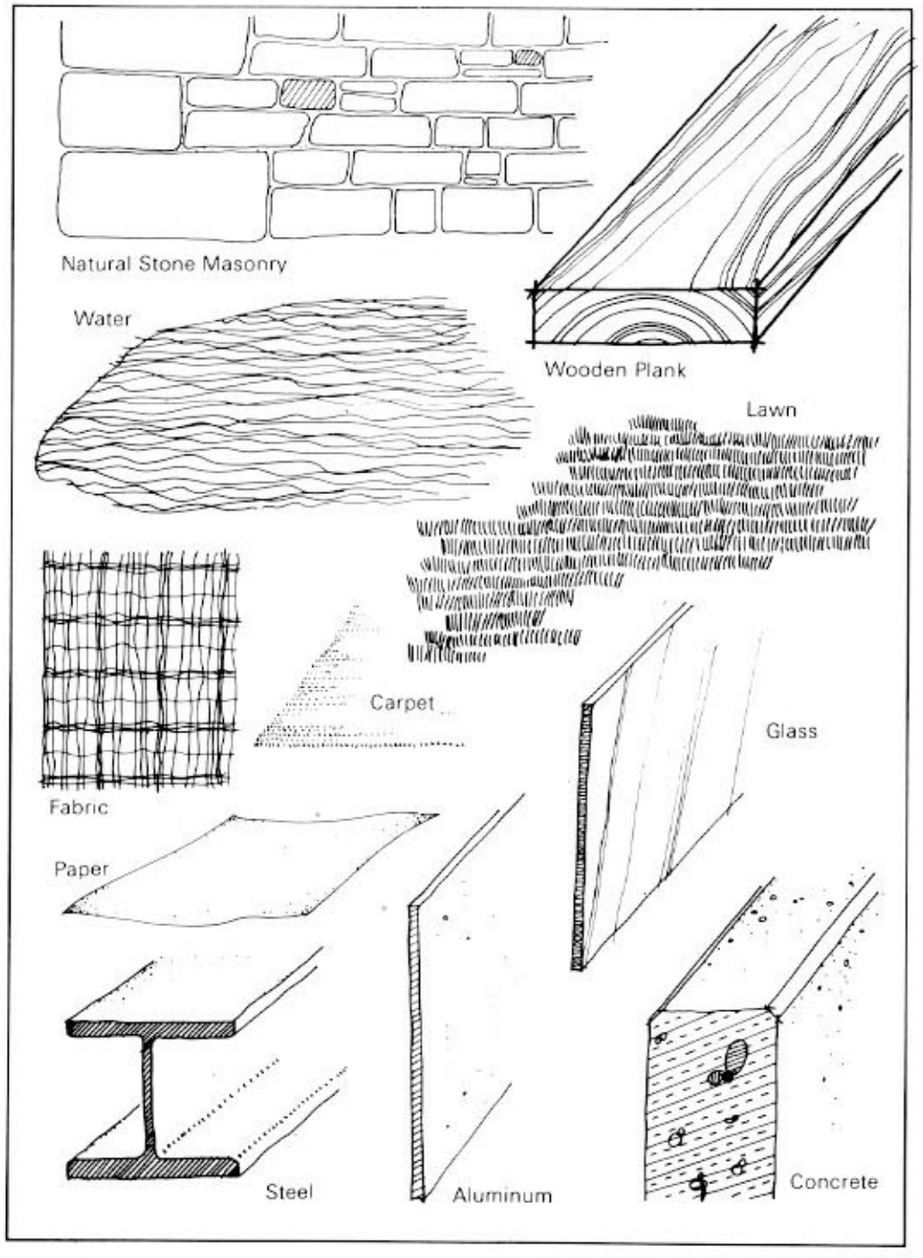


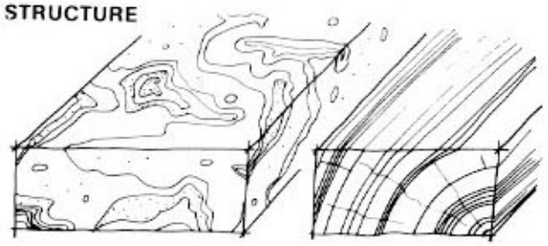
Figure 4.1 Illustrating Materials

Magnified illustrations or drawings of near-symbolic nature give us a good indication of the material quality (pores, grain, etc.) and perhaps of the type of surface as well.

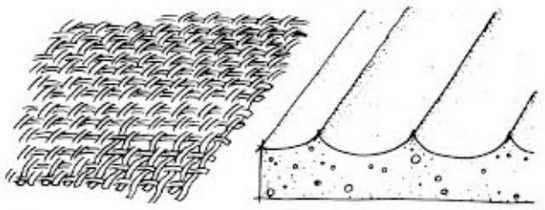
Comprehensible clarity and good drawing quality can be improved by the judicious incorporation of the material's characteristics into representations of areas and surfaces. With actual material surfaces we distinguish between:

- Structure (determined by a natural or chemical process),
- Texture (determined by construction or manufacture), and
- Facture (added by subsequent surface treatment).

STRUCTURE



inorganic and organic



woven

surface treated

TEXTURE **FACTURE**

Figure 4.2

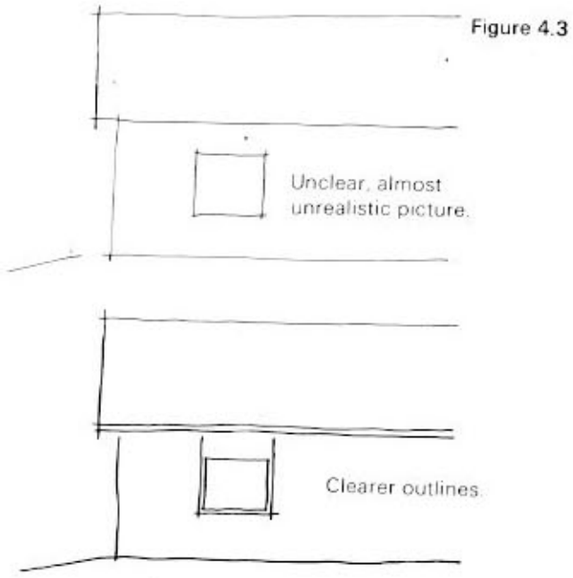
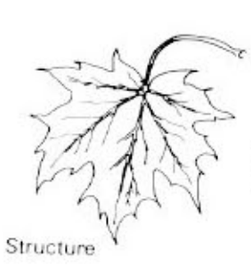


Figure 4.3

4.2 Surface Limits

A precisely drawn limit line is often enough to identify different surfaces.

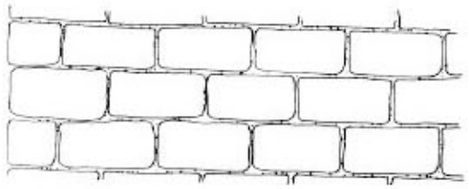
Most areas and surfaces are set off against others or their surroundings by black-and-white or colored optical delimitations, and these should be reproduced as exactly or true to life as possible. Different effects (a window in a concrete wall or white sheet of paper on a white tabletop) should be drawn in a manner that is typical of the material or its appearance.



Structure

Sheet of paper faintly outlined.

Bold outline—looks almost like a hole in the tabletop.



Texture

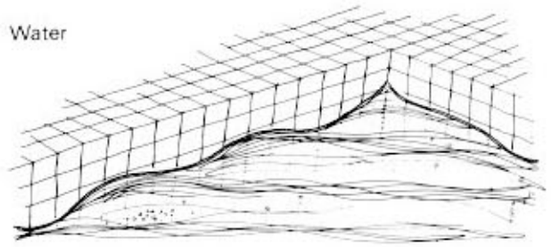
Facture

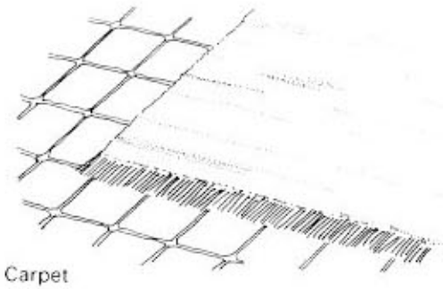
Figure 4.4

The surface quality or the appearance of the material which makes up the surface we are drawing plays an important part in this process. The boundaries of very bright surfaces can pose problems to begin with, but the economical use of a few dots at the surfaces' edges and corners can improve clarity. The effect is similar to what happens at the edges of different areas in overexposed or underexposed photos (alienation), which just goes to prove that links with reality have not been lost.

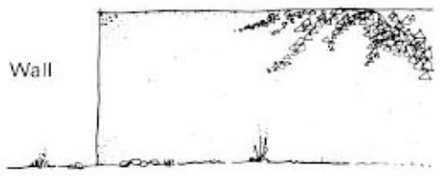
Even the thickness of a limit line by comparison with reality—i.e., the object represented—determines the quality of a good or bad reproduction of differing surfaces. The merely linear identification of the area's boundary is only one possible way to identify that area; the other is to fill in the various areas with graphic devices.

Water





Carpet



Wall

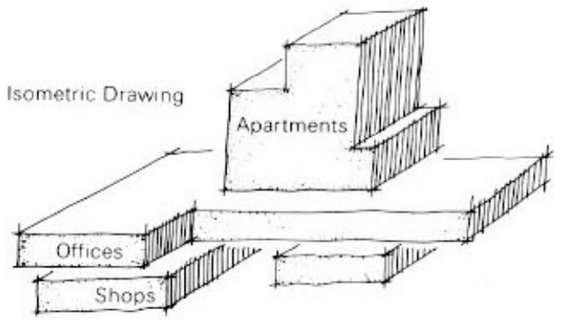
Curtain

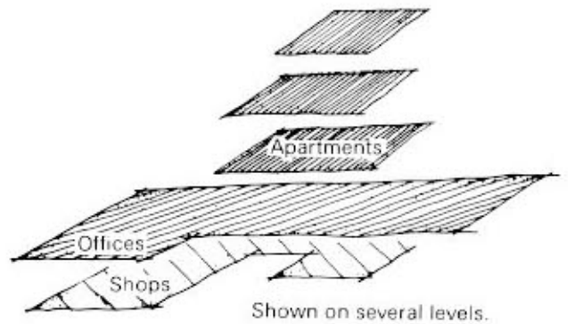
Figure 4.5

4.3 One Exception: The Visualization of Superimposed Levels

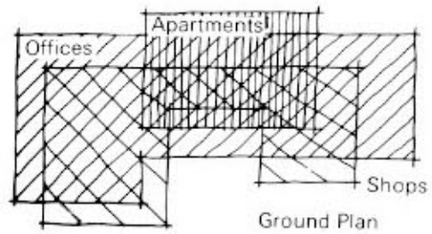
In discussions of technical problems or aspects of urban planning it may be necessary to give an exact representation of two or more superimposed surfaces of differing size and shape on a single picture plane. In this case the problem can only be properly solved by the use of hatching (and cross-hatching) drawn in alternating directions.

Isometric Drawing





Shown on several levels.



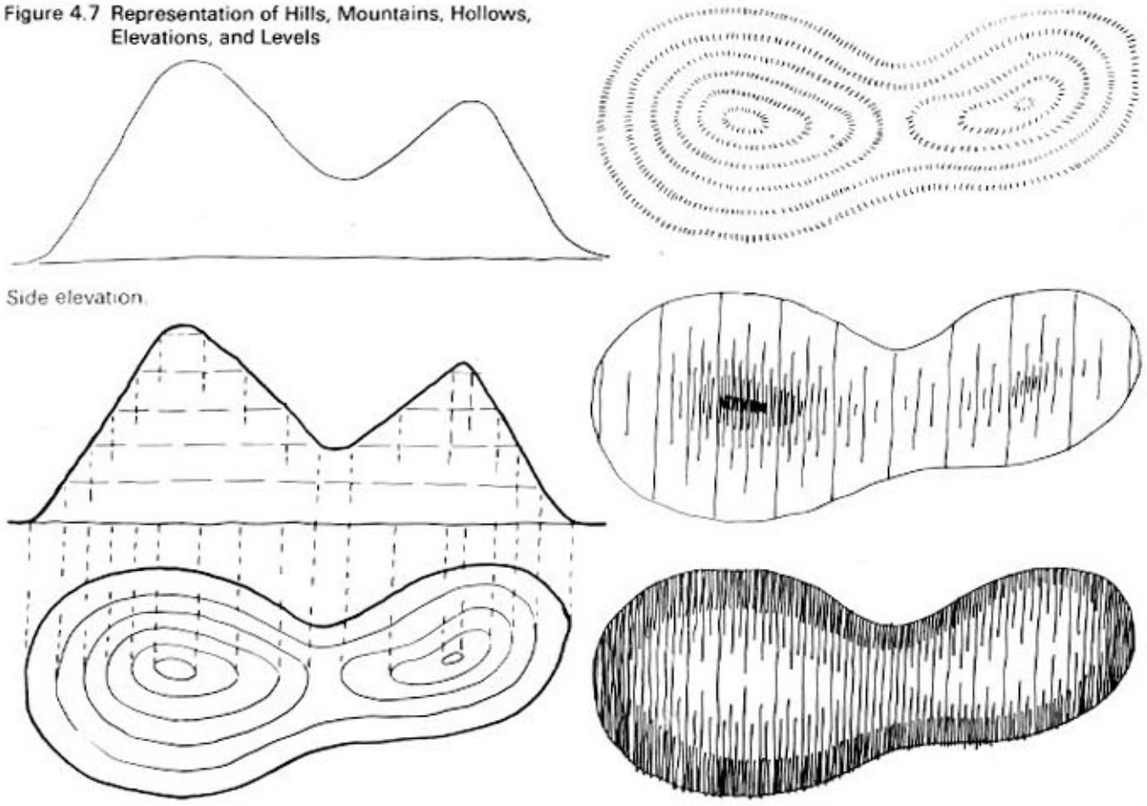
Ground Plan

Figure 4.6 Diagrammatic Sketches of a Building in Isometry and Layout

4.4 Hollows—Elevations—Hills—Mountains

Occasionally it will be necessary to draw all sorts of hills, eminences, and so on in a single plane, and for this we can use contour lines, banking, shading, and perspective.

Figure 4.7 Representation of Hills, Mountains, Hollows, Elevations, and Levels



Side elevation.

Top view with contour lines.

Top view with relief shading.

4.5 The Even Division of Line and Area by Eye

Dividing an area or line into even sections or lengths will at first seem difficult, but the solutions are in fact simple. With the eye some distance away from the paper, try to view the entire area or both ends of the line and then split it up optically into equal portions. Again, before committing pencil to paper, your desired sections or lengths should be firmly fixed in the mind's eye. Halving the distance between two points is not difficult either: the distance is magnified "for fun" and we then try to determine exactly where the center is. With a little confidence which will come with practice, we will be able to extend this process by halving the halves, and so on. We obtain quarters simply by halving twice, while further halving will divide a line into eight equal sections, and so forth.

With practice we should be able to estimate how big the subdivisions should be.

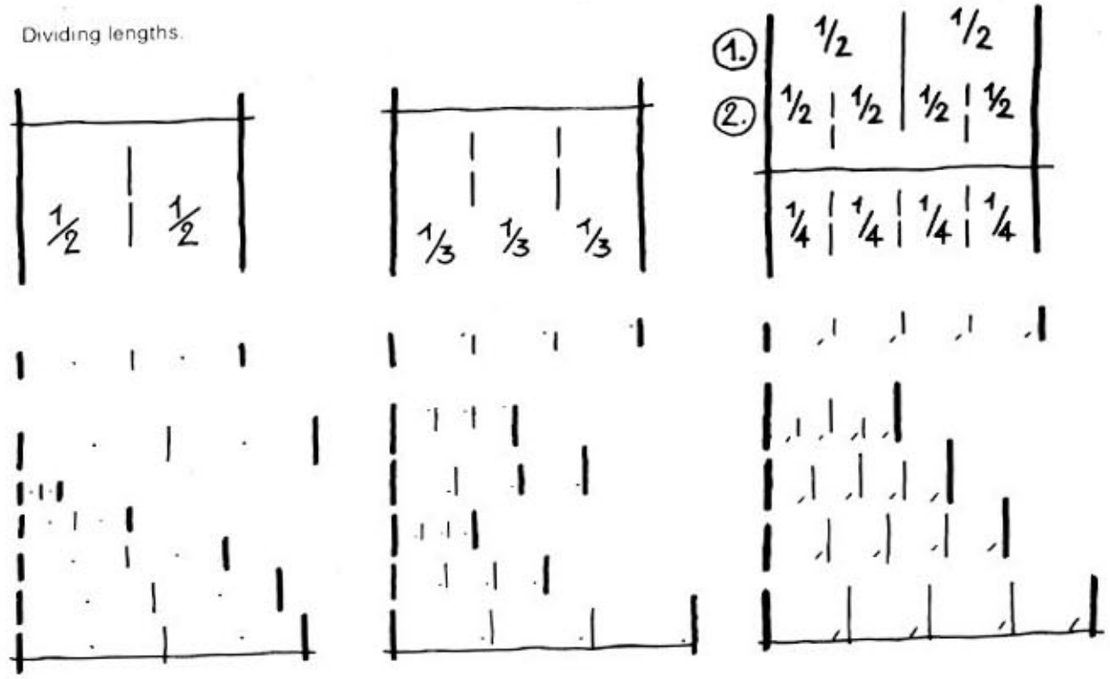
To divide a line into three equal parts, it is necessary to guess with the eye how long the third would be, then place it centrally between the two line ends.

Practice on a sheet of paper right away. With long lines you should take your time, estimate the thirds with your eye, and then start drawing the divisions.

Six equal parts can be easily obtained by applying the halving method discussed above.

Dividing a distance into seven or nine equal sections is easier if we start by splitting up the line with faint dots and then correcting rapidly as we go. A little practice will soon convince you that dividing lines and areas into equal parts is no great art.

Dividing lengths.



Practice—measure—then practice again!

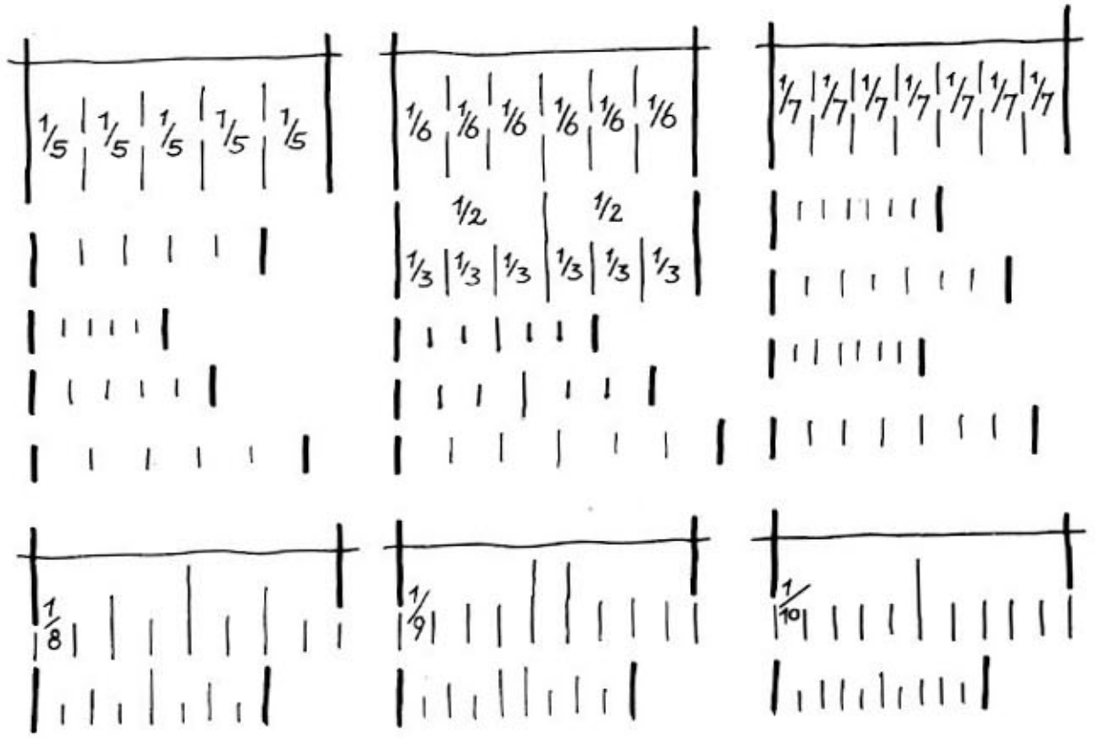


Figure 4.8 Exercises in Subdividing Linear Distances, Parts of Distances, and Line Lengths

4.6 Representing Solids and Spaces by Drawing Only Three or More Simple Viewing Planes

If you are as yet unable to draw perspective to show three-dimensional relationships within a two-dimensional picture plane, but you still wish to draw solids and spaces, there is a very simple method to help you achieve this: drawing the individual sides of the solid or space as separate views. This is an age-old method used particularly in the advanced civilizations of Persia and Egypt. Even children in their innocence easily tend to draw typical solids and spaces with clear, cohesive, and flat-folded elevations.

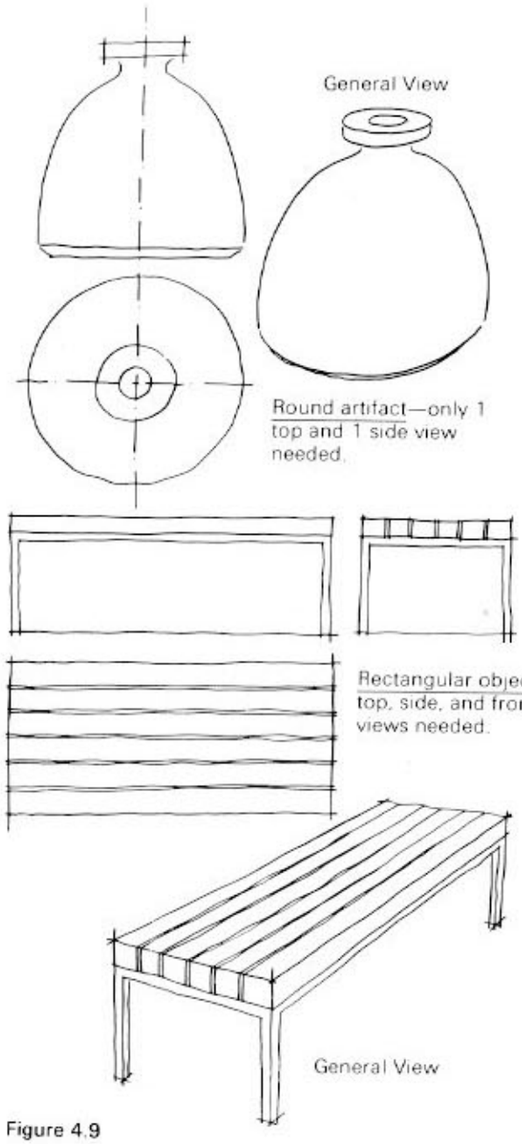


Figure 4.9

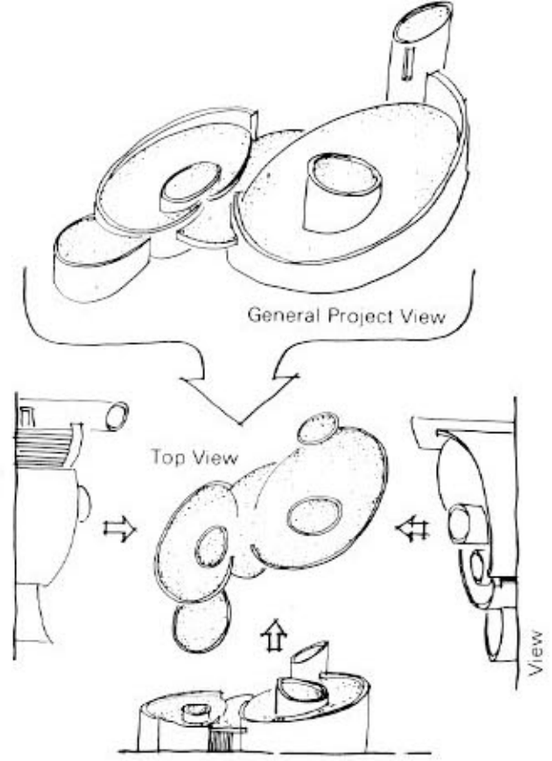
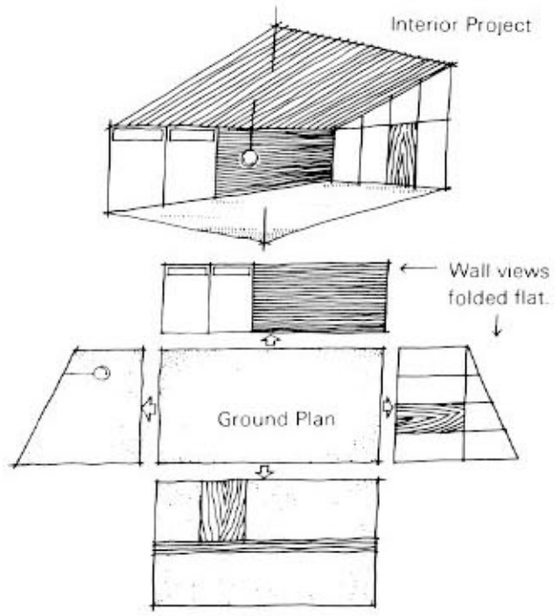


Figure 4.10



Room illustrated with simple flat views.

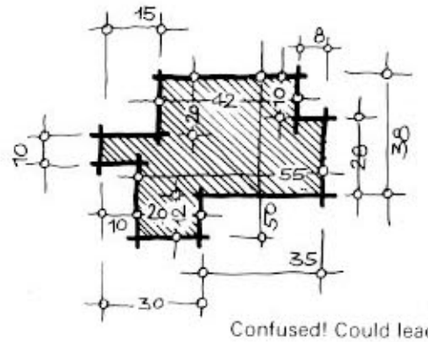
Figure 4.11

4.7 Dimensioning Sketches and Elevations

Dimensioning sketches and elevations may be necessary for two reasons:

1. to provide data for the construction of a building or the production of an object, or
2. to give a better idea of the actual proportions of existing structures and buildings.

The most important factors here are the main dimensions and main axes, which can be amplified by the addition of typical detail dimensions. Overall dimensions should be outermost in the drawing, while individual dimensions are placed further in toward the object. The thickness or arrangement of the dimension lines should in no way disturb the drawing or compete with it. Equally important are the dimension end points; i.e., from and to which point is the interlying distance actually measured? These end points must be easily recognizable.



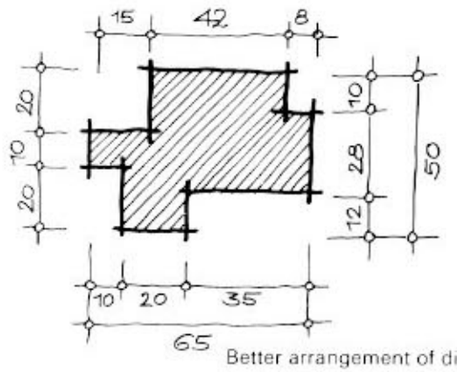


Figure 4.12 Confusing and Correct Dimensional Detail

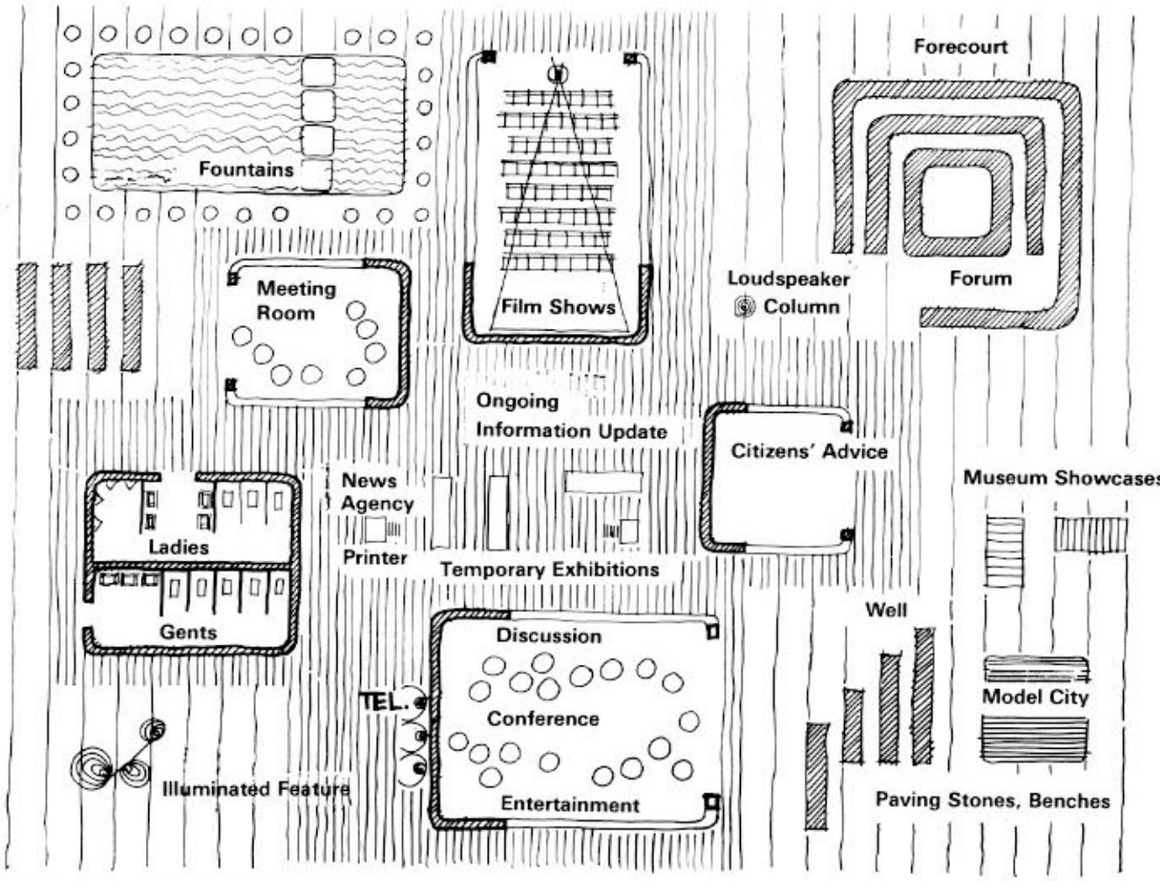
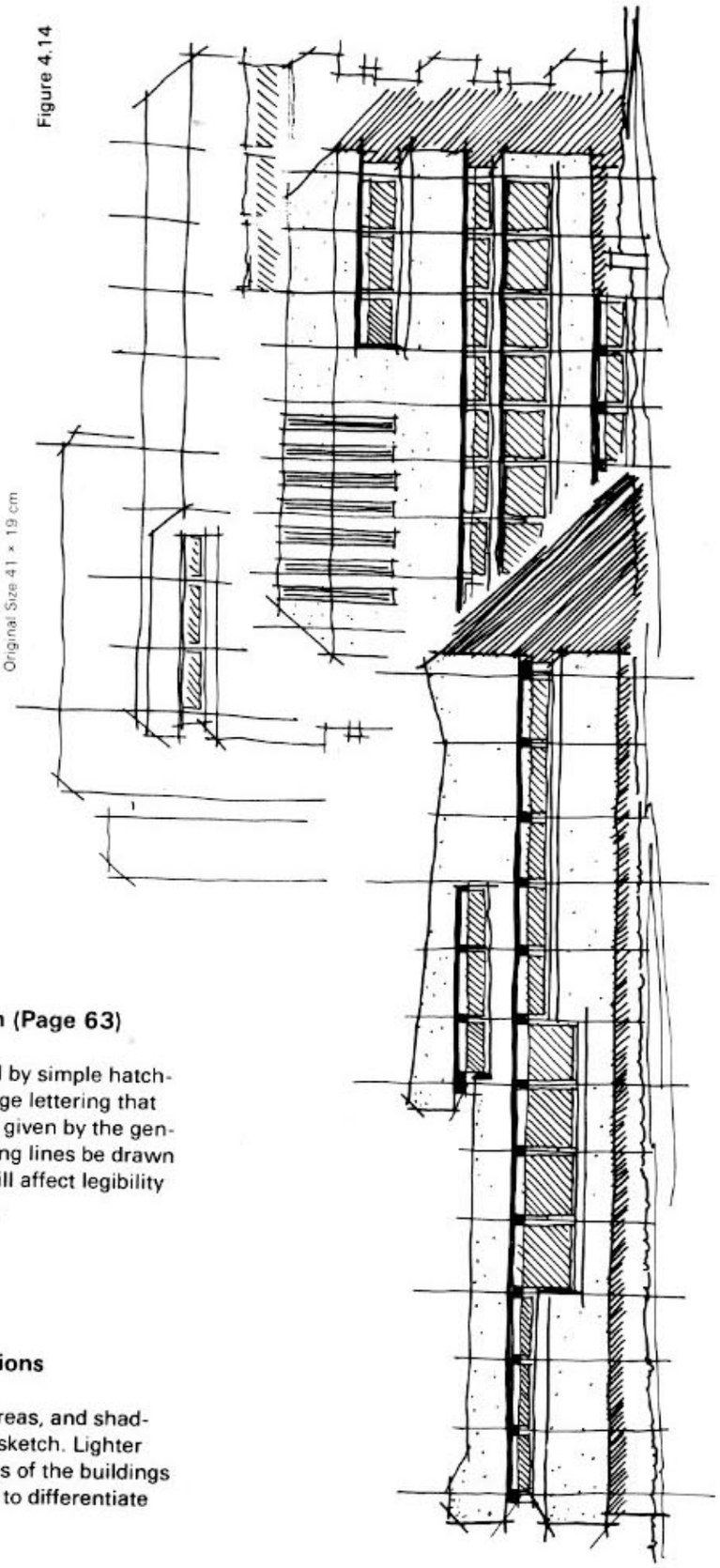


Figure 4.13 "Station"—Typical Orientation Layout

Figure 4.14



Original Size 41 × 19 cm

4.8 Orientation Layout Plan (Page 63)

Areas and spaces are suggested by simple hatching. It is vital to select and arrange lettering that does not destroy the impression given by the general view. Nor should the hatching lines be drawn through the letters, since this will affect legibility (see drawing at foot of page 63).

4.9 Exterior Building Elevations

Light wall colors, dark window areas, and shadows determine the flavor of this sketch. Lighter and somewhat detached sketches of the buildings in the background are necessary to differentiate the various masses.

4.10 Size, Clarity, and Legibility of Illustrations

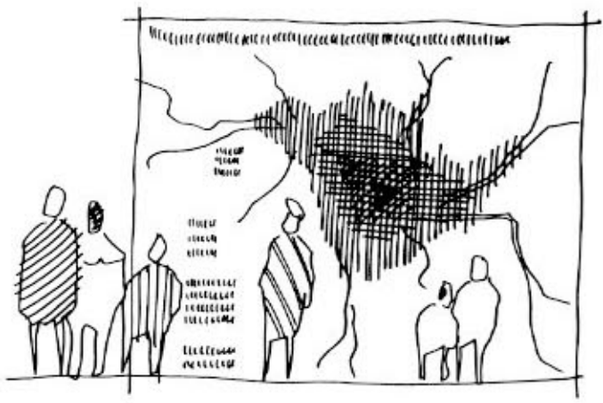
Clarity is first achieved by drawing the overall context. Care should be taken to provide optical and graphic points of contact. In terms of information density we should add that several sketches on different sheets of paper are always better than a single overloaded drawing. (Just think how unpleasant it is to look at a dress pattern, for instance; the maze can only be unravelled by staring at the pattern and pursuing individual lines.) At least one-third of the areas in *every* drawing should be left blank as white surfaces so as not to irritate the optical nerves too much.

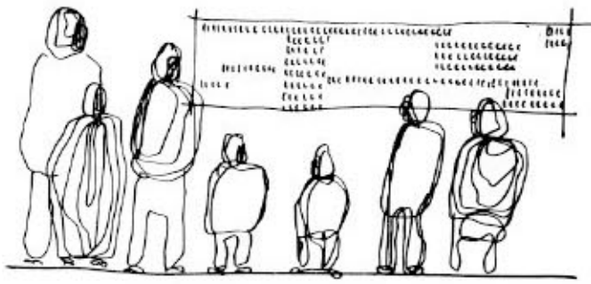
Many examples especially of Oriental drawing, show that the drawing area is far from completely covered. At the same time we must ensure that fear of overloading the paper does not lead to tiny postage-stamp drawings on huge sheets of paper. Care should always be taken to attain satisfactory and pleasing relationships in the size of drawing.

Just as one listens to other people's points of view in discussion, so the draftsman should bear in mind his potential audience. Sketches intended for a small discussion group, for example, should be kept small as well, while for lectures and large discussion groups, account should be taken of the greater distance between illustration and spectator. It is always awkward and embarrassing in discussions, talks, and meetings when the session is interrupted by people jumping up to take a close look at one's sketches and drawings.

The way in which twentieth century urban planning is decided on the strength of toylike models (almost matchbox size) would be funny were it not so tragic.

So always go for legibility, scale, and proportion.





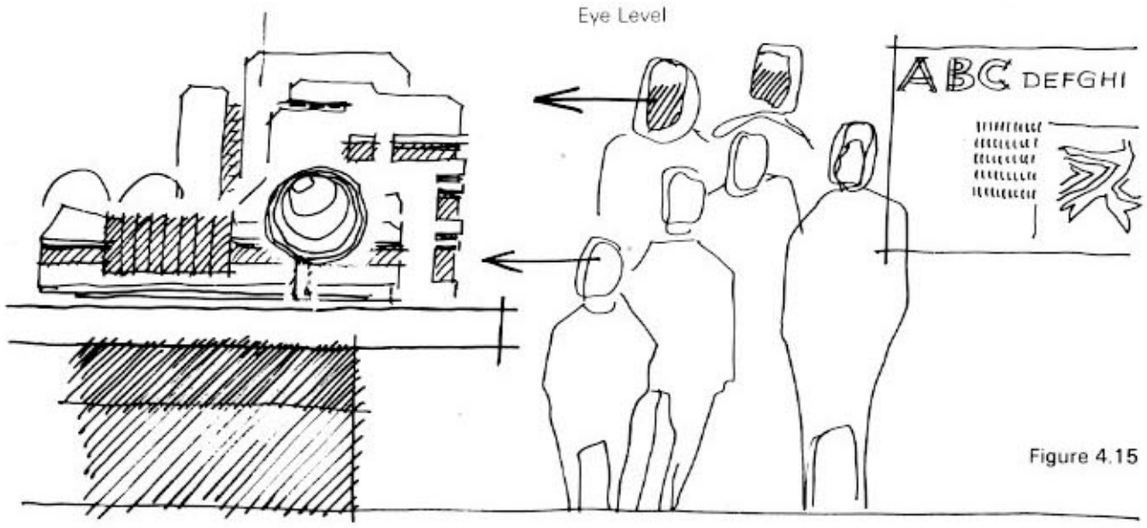


Figure 4.15

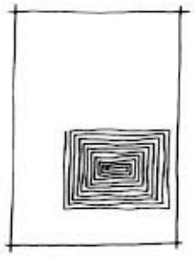
Attractive Town Planning Model

5.0 Good Drawing Arrangement and Layout

The arrangement of freehand drawings and sketches on a sheet of paper needs to be considered, especially if they are meant to be looked at and evaluated by others later on. Freehand drawings should always make use of the entire sheet format, since tiny drawings on large sheets of paper usually look curiously lost.

5.1 Prominent

One illustration dominates the area, and everything else appears of secondary significance (for space and surface drawing).



Prominent

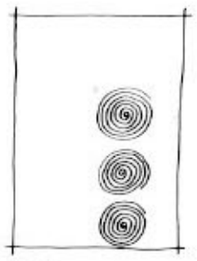
5.2 Framed

The tension between two elements (poles), e.g., structural sections, determines the drawing's statement.

Framed

5.3 Rows

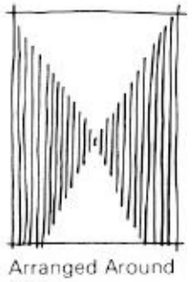
The statement is determined by the repetition of identical or very similar things in a row. The monotony of a row can be overcome by highlighting one of its component parts.



Rows

5.4 Arranged around Axes

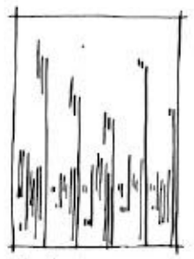
The arrangement of equal surfaces around one or more axes seldom gives a satisfactory result, and the important statement is frequently suffocated beneath the formalism of such empty symmetry.



Arranged Around Axes

5.5 Rhythmic

The picture is dominated by characteristic and similar forms that recur at given intervals. It will seldom be possible to construct a sketch in this way.



Rhythmic

5.6 Grouped

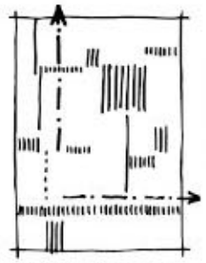
The regular repetition of identical groupings can be used in exceptional cases provided we make sure that the typical feature of the individual group is kept quite distinct. Here again, the rather lifeless groups can be enlivened by making one more prominent than the others.

Grouped

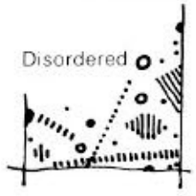
5.7 Agglomerations (Ordered and Disordered)

Ordered agglomerations, usually arranged perpendicular to each other, are a typical occurrence in our technological age.

A certain equilibrium between the various areas and their graphic values (optical weight) is desirable, and an adequate amount of space (white!) between the areas helps to avoid confusion.



Agglomerations



Disordered

5.8 So-Called "Free Forms" and "Free Composition"

You could be forgiven for thinking that the "free form" depends on the total absence of any of the criteria so far mentioned. In reality however the statement made by the free form is essentially determined by the reciprocal proportions of individual sections and lengths and by a more or less uniform statement (purity) of individual lines (whether only arcs, angles, straights, etc.).

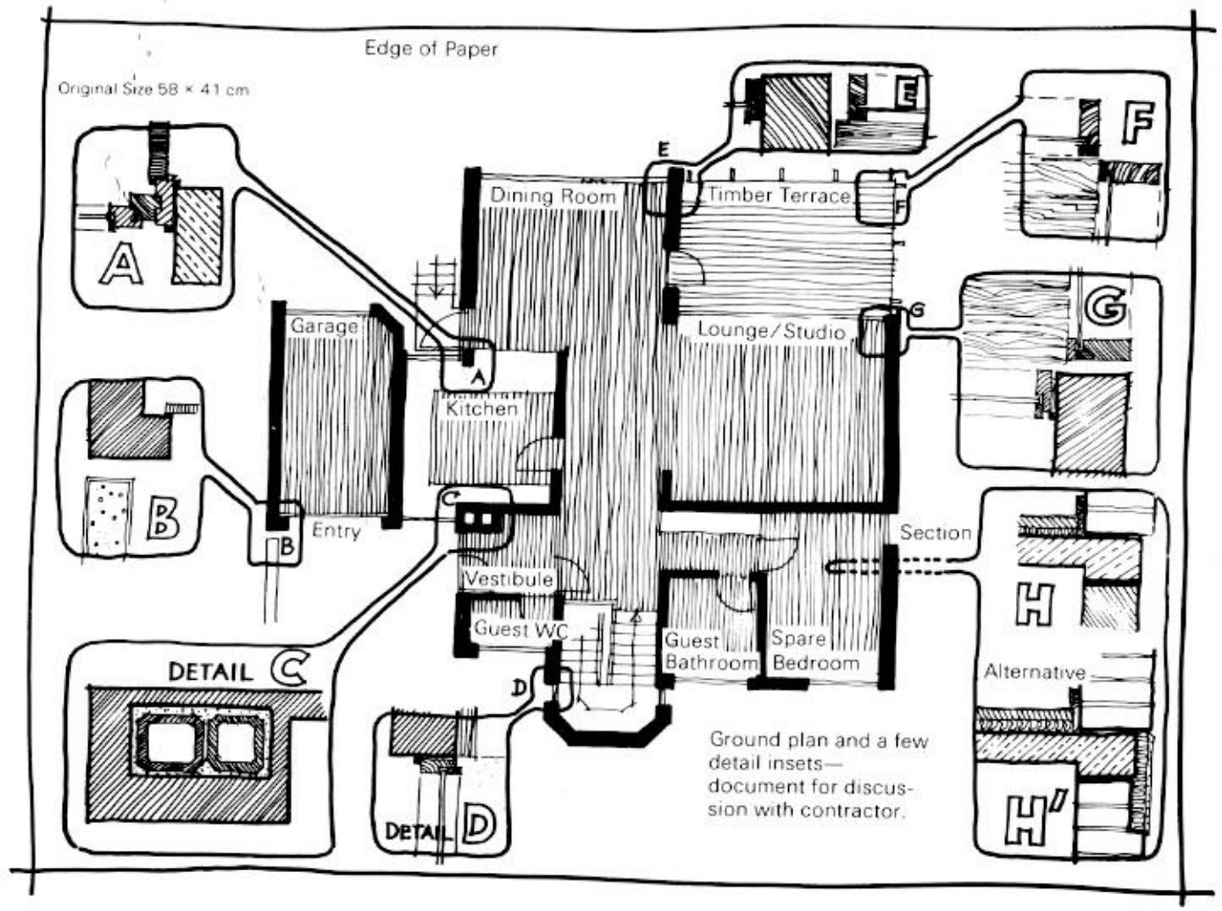
Unconstricted "Free" Form

The typical forms shown above are easy to work with, learn, and understand at once; with practice it will be possible to get away from them and make one's own freehand drawings in accordance with one's own specific purposes and motifs. As with all creative activities, any mannerism in freehand drawing is dubious, since it is only governed by purely formal principles.

It is advisable to commit the above examples of layout and arrangement to memory. It will also be useful to study the works of good masters in galleries and print exhibits for composition and arrangement. It is even good and not at all silly to observe a very good drawing for (almost) hours and to "feel" each stroke in the mind. Use your critical powers to ascertain why a particular stroke was made at a particular place. If you can go back and see the drawing one or two days later you will find that your judgment (the drawing's strong and weak points, its good and bad sides) has improved.

5.9 Usual Arrangement of the Drawing Sheet

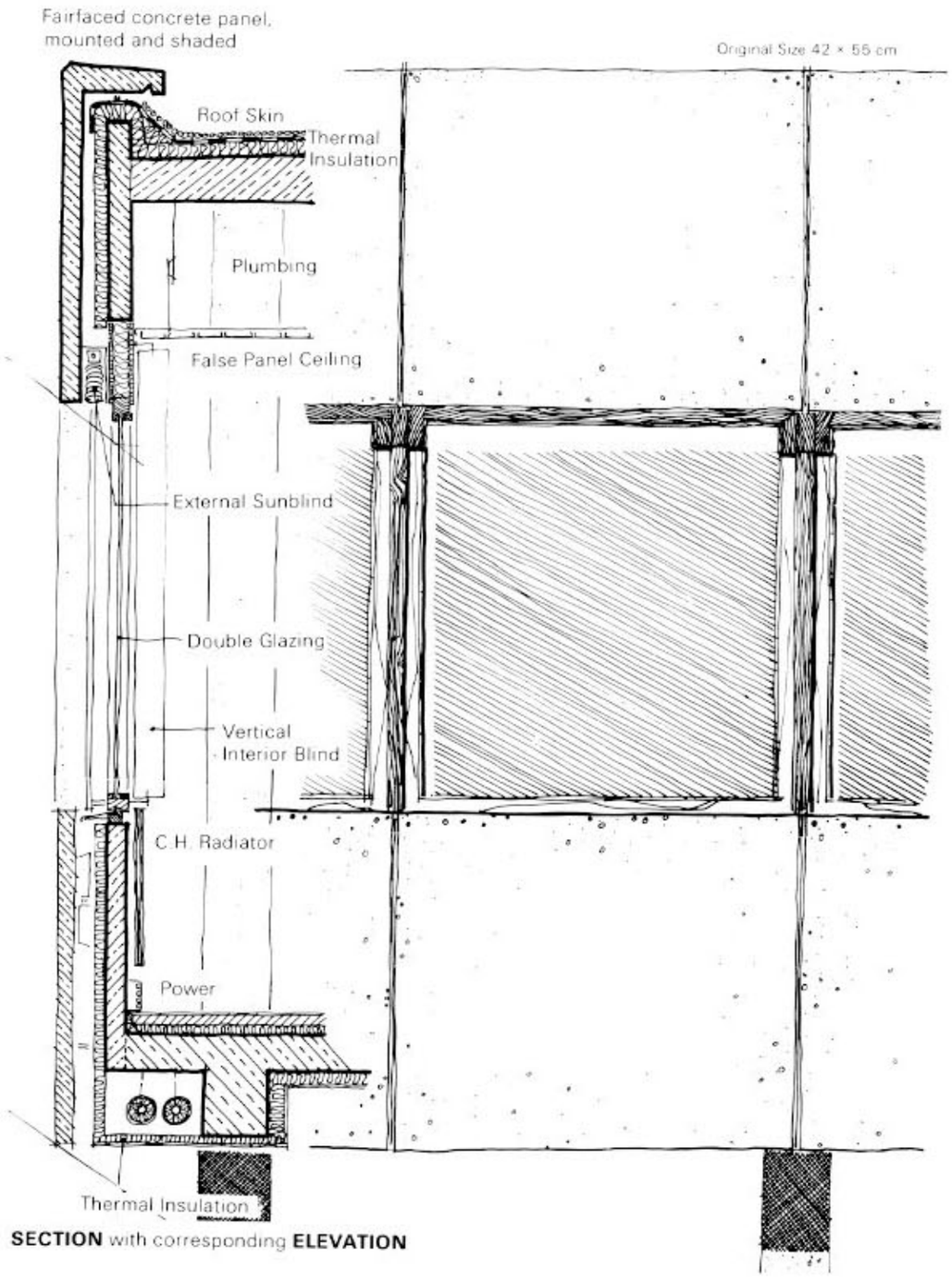
As a general rule it has become the custom when drawing solids and spaces to put the ground plan in the lower part of the paper with the associated exterior and interior views above. In an equally logical but rather different manner, the ground plan is placed in the center of the sheet and the various exterior and interior views are arranged around it. One good trick is the explanatory method where a small section of the view is added as an indication of potential construction. This is useful for many technical drawings and trades. The addition of explanatory detail sketches to a drawing, e.g., a ground plan, is a legitimate and consistent informative device.



6.0 Accuracy and Outline

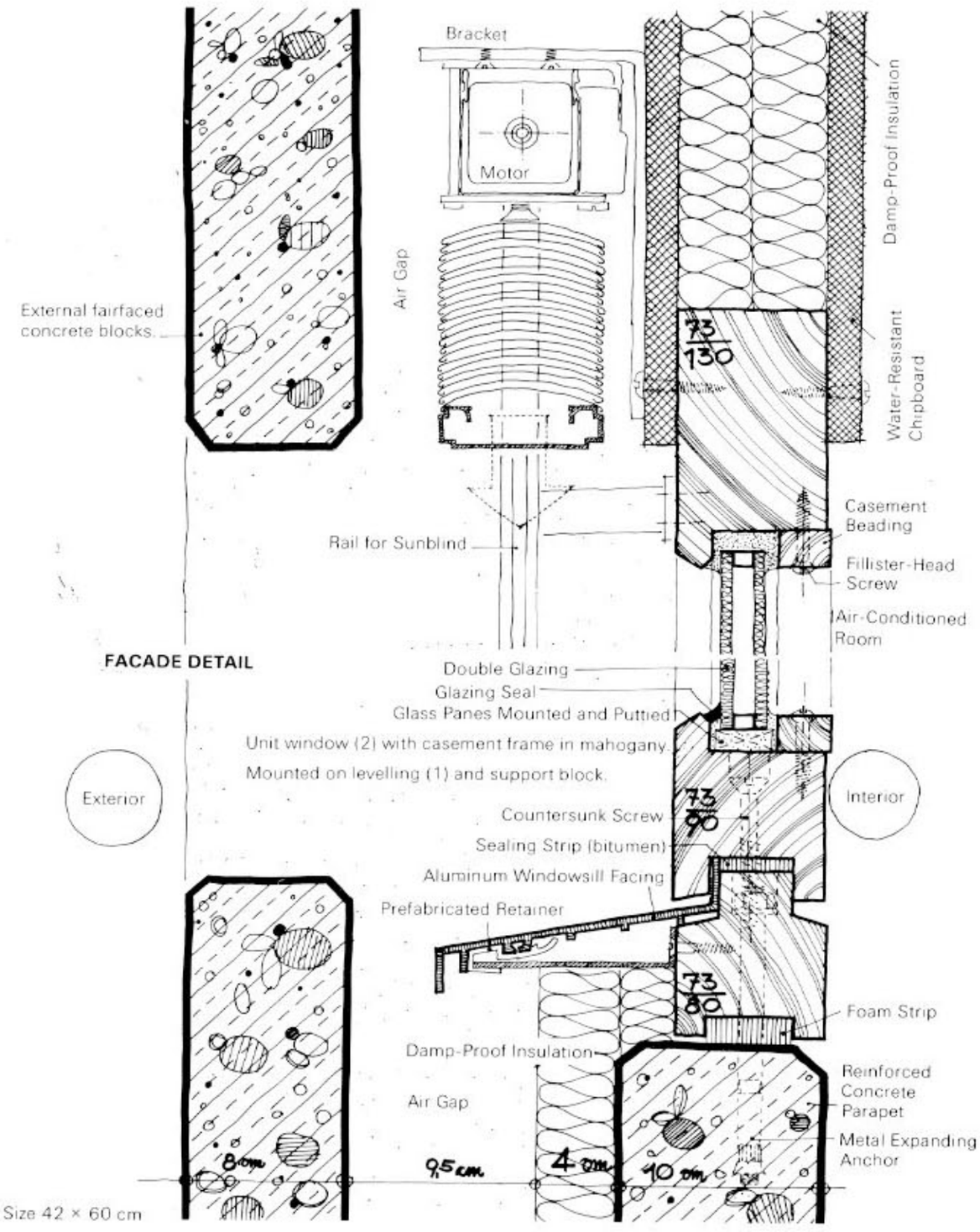
The guiding principle here must be "Quality alone convinces!"

Apart from anything else, this means that the greatest possible accuracy in drawing is always more highly judged than one or more inaccurate drawings or rapid sketches. One fashionable artist or another may achieve recognition for the quick rough sketch, but this is the exception. In reality, "artistic freedom" leaves little room for untidiness.



SECTION with corresponding **ELEVATION**

The primary task is to show the main object and its outlines (as accurately as possible without aids), then the more important details can be shown. Details can also be placed on the same sheet to a larger scale provided enough space is left for them, and can also give a very pleasing effect: the detail gives the object more substance and the need for shuffling several different sketches is eliminated.



FACADE DETAIL

Original Size 42 × 60 cm

7.1 Conventions in Lettering

The lettering is a most essential part of any drawing. As handwriting can tell us much about its author, so lettering either can influence or emphasize the image of a newspaper, company, interior, or drawing, or can ruin it by inferior quality. Fashionable lettering is usually short-lived and therefore little suited to our purposes. Good text however can highlight, consolidate, and improve a subject.

Architects and interior designers prefer block lettering, which they feel reflects the clear, simple, and unadulterated intent of their creations. Standard lettering preferred by technicians and engineers has the aesthetic character of "frozen" handwriting.

7.2 Types of Lettering

Lettering, or text, is a sign language used to capture and impart information, and information in turn is used to communicate with other people or to assist the memory. This means that previously imparted information can be recalled and revived. Writing first emerged in three main areas of the globe (approx. 5,000 years ago): in China, Mesopotamia (Near East), and Egypt.

In the beginning, the more important objects in life were sketched more or less true to life, but later on they became symbolized and abstracted. Cuneiform writing is a good example.

"Writing" consists of individual letters or figures which represent information either individually or in particular groups. Its essence lies in its legibility, clarity, and the untainted transmission of the information content. Additional information can be added (superimposed) to written information by means of contractions.

This can also be done by distortion. For example, the observer's attention may be drawn to the exotic character of a Chinese restaurant by lettering on the menu or on an outside sign in the Latin alphabet that has been given a Chinese look. "Gothicized" lettering can provide the date of a historic choir stall or the title for a book on Gothic art.

Generally speaking, however, such revivals of ancient styles should be avoided. We live in an age which must find, and has already found, its own forms and symbols.

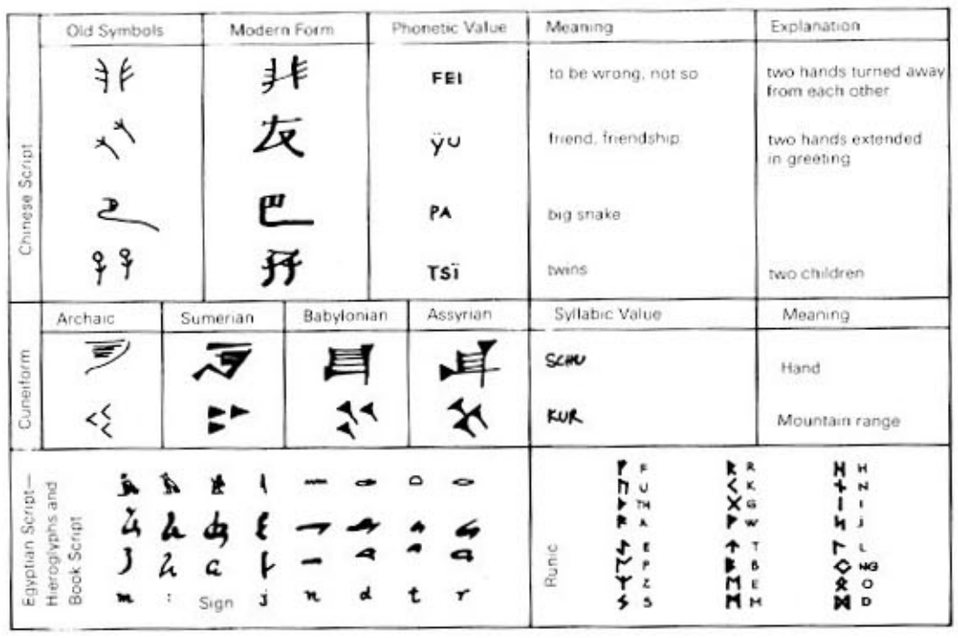


Figure 7.1

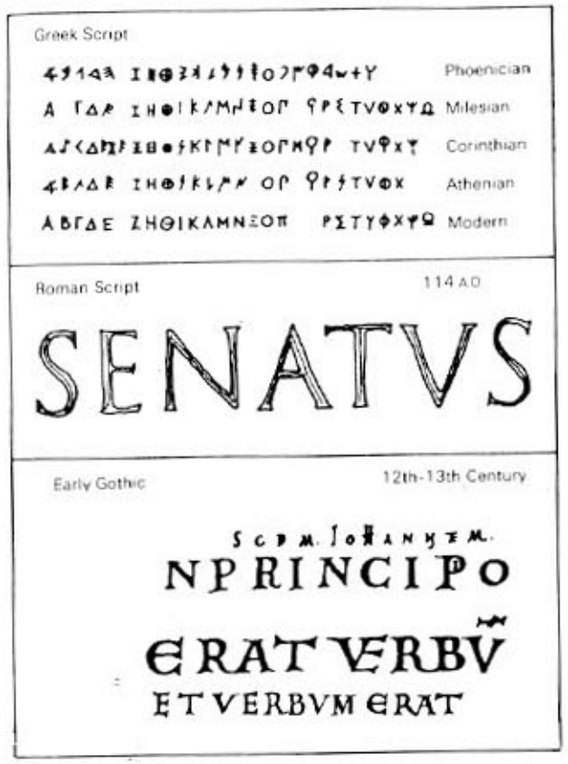


Figure 7.2

Figure 7.3

7.3 Tone and Weight of Lettering

Just as we use the same grade of paper and the same drawing instrument for related drawings and sketches, so we must use the same instrument for drawing and lettering, since different tones or shades will destroy the picture's unity, disturb the drawing, and possibly lead to confusion and misunderstanding.

An ink drawing therefore must always be lettered in ink; a pencil drawing should only be lettered in pencil.

Lettering can lend the drawing added expression, but it can also detract from it. This must be determined once the drawing is finished and before adding the text. One should always avoid using ill-considered styles which will appear alien to the drawing instead of an integral part of it.

7.4 Sizes of Lettering

We cannot stress often enough that a clear, distinct, and simple text is better by far than distorted, mannered, and hence affected lettering, since it also influences the face—i.e., the outward form—of what is written.

Adequate legibility, text height, and letter thickness are very important elements of any illustration. Lettering should possess a balanced size and space relationship with the background, the object, and the drawing's statement. Superfluous, self-evident words should be left out. (Example: "Design of a leisure area to a scale of 1:50." It is quite adequate if the sketch is entitled "Leisure area—1:50.")

Lettering that is perhaps too light or too small is always more tolerable than text that is too big,

looks out of place, and which overpowers the drawing. Above all, remember that a lot of different typestyles on the same page are just as bad as too many different heights.

7.5 Styles of Lettering

Block lettering has proven to be quite adequate, with its simple, perpendicular capitals constructed of straight lines, circles, and arcs. A perfectly clear and readable text face is achieved with simple geometrical lines (straight and curved) in which line thickness is matched to letter height, by optically perfect spacing and a clear tonal contrast with the background. The succinctness and clarity of a textual statement is essential and most convincing to the reader.

In addition, the proportions of the individual letters and numbers can be easily learned with a simple diagram, and lettering should come easily with a little practice. It is sometimes even legible upside down to the person opposite you.

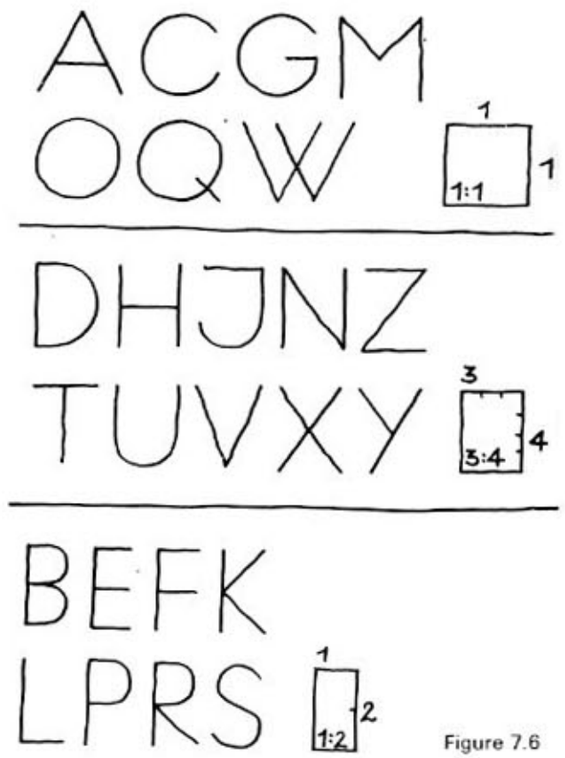


Figure 7.6

1234567
890

Figure 7.4

Try not to slant the letters or add little flourishes or other trifles. The same goes for the numbers as well, of course. Anyone who has experienced the dire consequences of unclear numbering, misleading figures, and careless playing with the numbers 1 and 4, 3 and 8, 3 and 5, or 6 and 9 will know how sensible and safe it is to keep text and figures clear and simple, both singly and in groups.

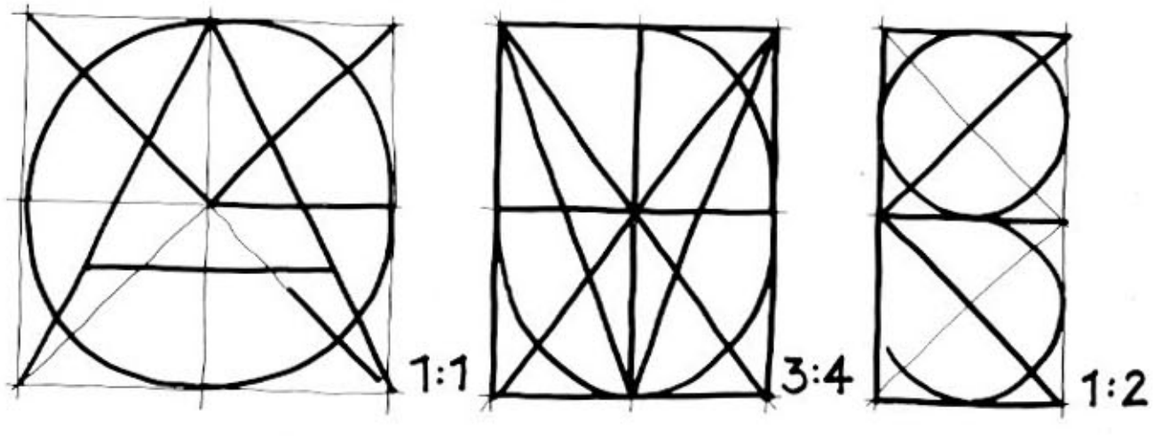


Figure 7.5 Face of Drawn Black Capitals (width-to- height ratio of letters)

The need for good, clear lettering makes it absolutely vital to give some brief notes here on drawing and inscribing the various textual components.

An A must occupy the area of a square; its crossbar can only come in the lower third—other forms will look too wide or too thin.

The B should be inscribed within two squares, one on top of the other. Its curves are arcs of a circle. All three joints should end in short lines horizontal to the upright.

The letter C consists of a three-quarter circle, and anything else will tend to be too narrow or manneristically wide.

D is drawn with a full semicircle and should look substantial. This is done by putting long horizontal connections to the upright.

E is inscribed in two squares, one on top of the other, and it is important to ensure that the central bar is exactly the same length as the other two.

F is the same as E without the bottom bar. Its two bars must be of equal length: the ends of the bars must be precisely aligned.

The outer line of the letter G should be an almost complete circle. Exactly halfway up the right-hand side of the letter, a horizontal line is drawn from the circle line in to the center. The line should be kept short. Any extraneous additions and deviations can only be bad.

H stands in a vertical rectangle of a height:width ratio of 4:3. The bar should be at half height level. The system sketches on these pages clearly show that in principle all horizontal bars in letters should come at the same height—i.e., half the letter height, which also corresponds with the height of the center of a circle.

The letter I is just a vertical line. Dots and serifs should be avoided.

J is inscribed in an upright rectangle with the height:width ratio of 4:3. The lower part of the letter consists only of a near-semicircle.

K occupies an area with the superimposed squares. Its two obliques move up and down respectively from half letter height at an angle of 45 degrees.

The letter L is very simple. The lower stroke should be half the length of the upright.

Figure 7.7

The letter M is written so that it occupies a square field. Care should be taken to ensure that the two outside uprights (left and right) are absolutely vertical.

The letter N is also inscribed in the 4:3 ratio rectangle.

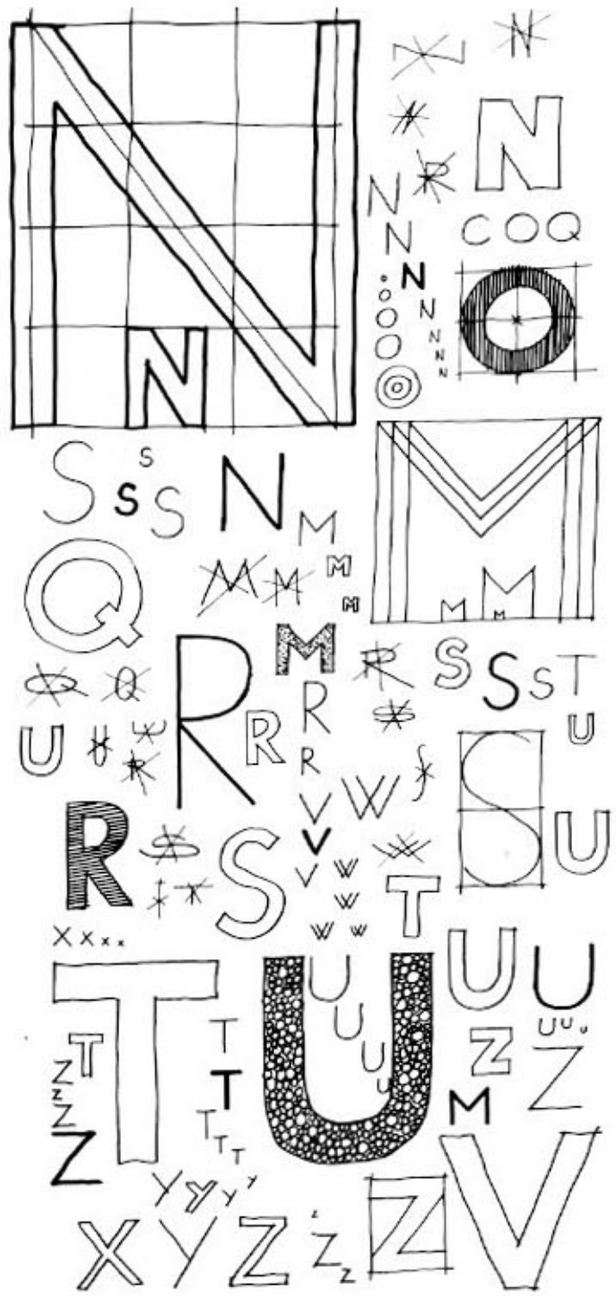


Figure 7.8

Shapeless ovals should always be rejected in favor of the pure form of the circle for a truly clear text. The letter O should thus be a complete circle.

P is based on a height:width ratio of 2:1, and its upper part consists of a semicircle with horizontal lines linking it to the upright at the top and at half height.

The letter Q is of course based on the O. Make sure that the tail, drawn at 45 degrees, actually ends in the bottom right-hand corner of the theoretical square.

The R can be seen as an extension of P; its tail is also drawn at 45 degrees from the letter center.

The letter S is often the cause of genuine difficulty in attempts to achieve a succinct character. This becomes easier however when we visualize its basic geometrical construction. The letter S consists of two circles—one above the other—whose lines are not completely closed. It is easy to imagine the transition from upper to lower circle as being oblique; geometrically, it must be horizontal.

T fits neatly into the 4:3 rectangle.

You should now be able to work out the constructions of the remaining letters for yourself: U has a semicircle at the bottom with two vertical lines either side.

V is again incorporated into the 4:3 upright rectangle. The only letter that gets wider is the W, which consists of two V's drawn immediately side by side.

It is now easy to see that the letters X, Y, and Z are constructed within the 4:3 ratio rectangle.

For the sake of "character" one should remember to make the leg of the Y oblique (as an extension of the top right-hand arm).

Numbers of the same type are governed by the same rules: straight lines and arcs of a circle. With numbers, total unmistakability is an essential factor (wrongly read numbers lead to misunderstood data and hence to error).

With the number 1, its first stroke should not be horizontal because it could be taken for a 7.

The 2 has a semicircle at the top connected to the horizontal base by an oblique at 45 degrees.

The 3 only has an arc in its lower half—the top consists of straight lines at an angle of 45 degrees to each other. Otherwise there is always the danger, if done quickly, of confusion with 8.

4—its upper field must be fully closed. 4 ends at the top in a triangle point.

To prevent confusion between 3 and 5, the 5's top left-hand line must always be kept absolutely vertical.

The figures 6 and 9 should be executed by first drawing a full (uncompressed) circle then adding the tails at an angle of 45 degrees tangentially to the circle. Any other form will naturally imply possible confusion and error.

The figure 7 might be mistaken for a 1, so draw a short horizontal bar at half height.*

The figure 8 should consist of two full circles, one on top of the other.

It is advisable to avoid drawing zero as an oval and to use the full circle for this figure.

Clarity and freedom from superfluous forms will be more convincing and will convey the impression that the author of the lettering really has a clear concept in mind.

*Translator's note: The author's comments regarding numbers 1 and 7 do not apply in America and Britain; since 1 is rarely begun with an upstroke there is no confusion with 7.

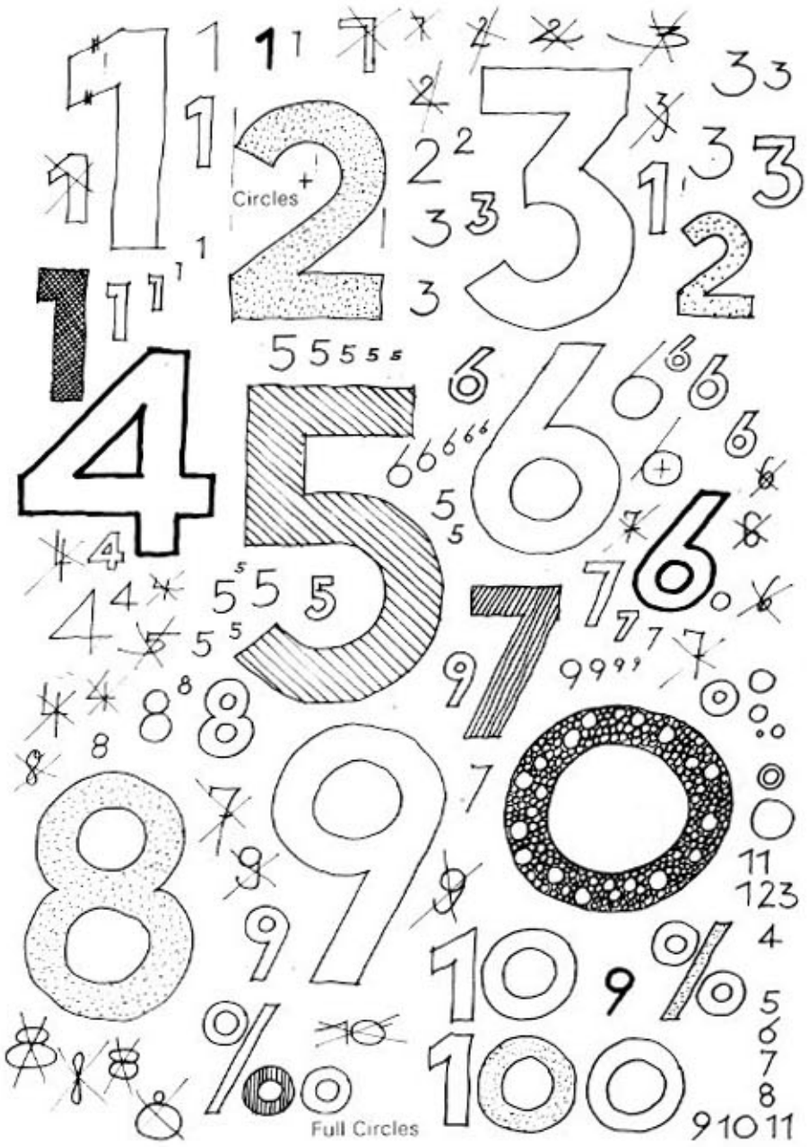


Figure 7.9

Figure 7.10 Model for Lettering Practice

AAAAAAAAAABBBBCCCCC
CDDDDDDEEEEEEFFFFFFFFFF
GGGGHHHHHHHIIIJJJJKK
KKKKLLLLLLMMMMNNNN
OOOOOPPPPPQQQQQ
RRRRSSSSSTTTTTUUUUU
VVVVVWWWWWWXXXXX
YYYYYZZZZZ11111222
333344444455555666
777778888899999OOOO

Please note that wide and narrow letters and numbers require different spacing, each according to its graphic weight.

In your further exercises, aim at equalization of optical balance.

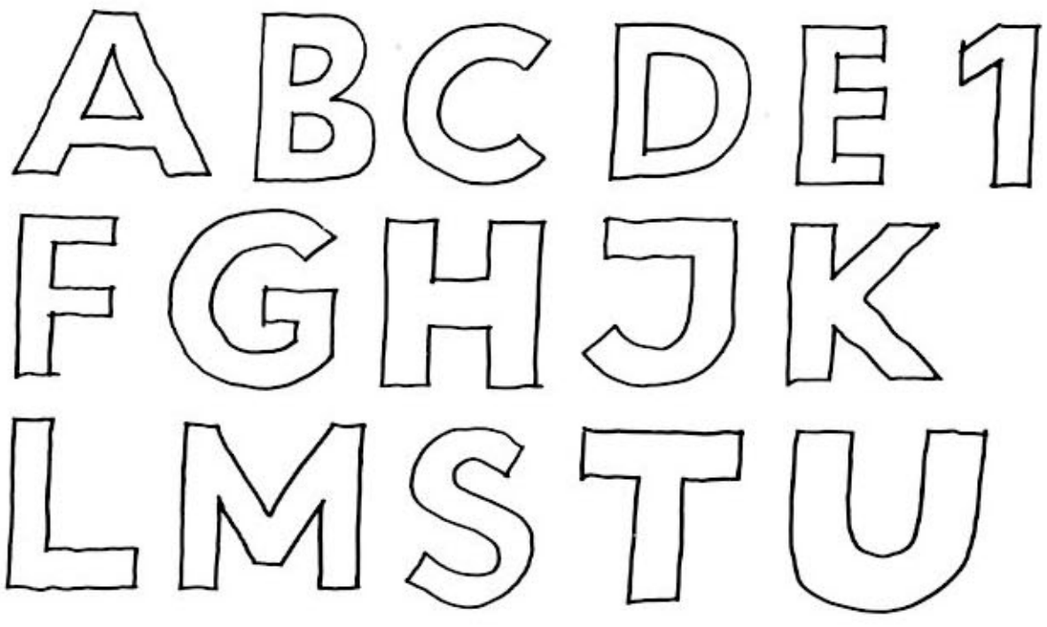
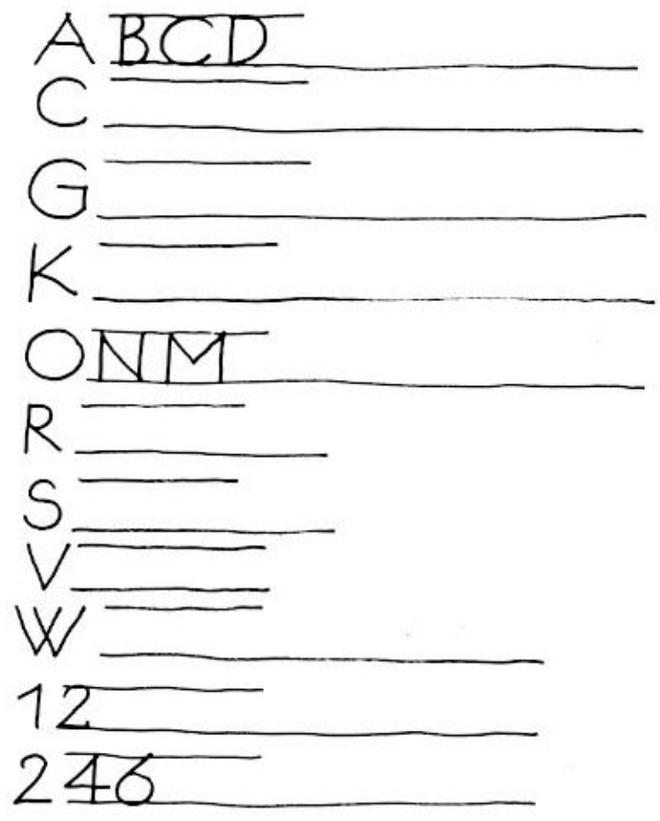
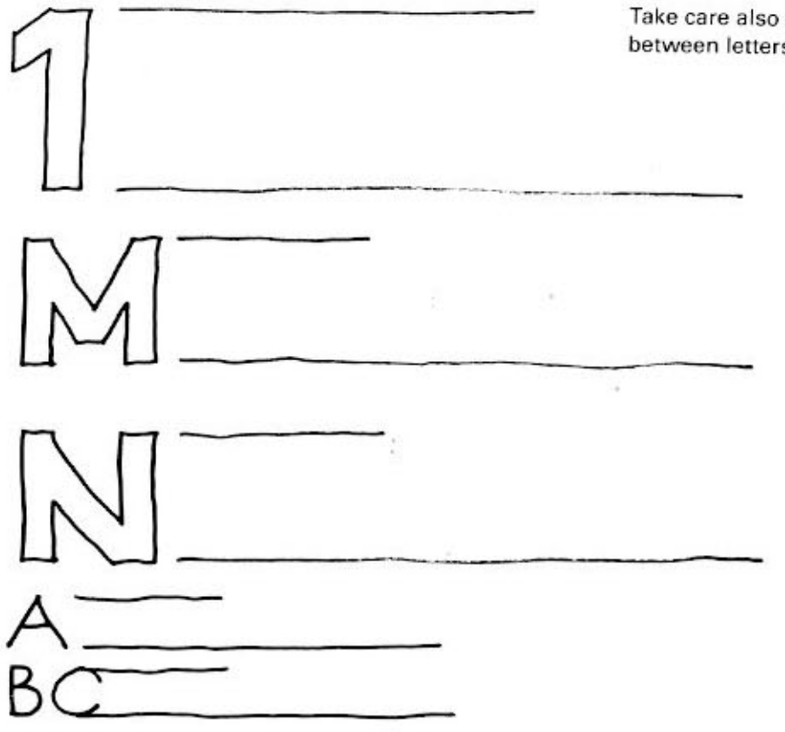


Figure 7.11 Space for Lettering Practice (start lettering here!)





Take care also to equalize the internal distances between letters and numbers.

Figure 7.12 Good and Not-so-good Lettering

Stencil Lettering

LETTERING ART

too closely spaced

LETTERING ART

letters correctly spaced

LETTERS

too faint

LETTERS

correct line thickness for letter height—balanced effect

FURNISHING

standard lettering for mechanical engineers

FURNISHING

wider lettering, architects' script

store

outlines too thin

store

better, but where are the interiors?

ARRANGEMENT

standard lettering

ARRANGEMENT

ditto, filled in

ARRANGEMENT

architects' lettering

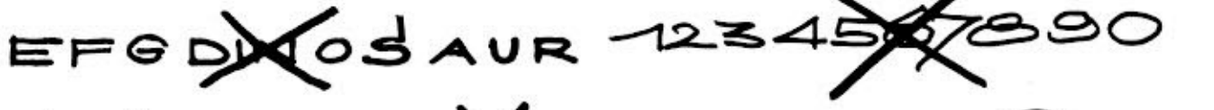
ARRANGEMENT

ditto, filled in

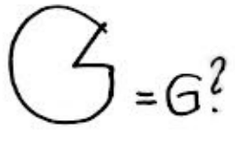
Examples of really bad lettering:

disfigured

distortion



unbearably mannerist scripts

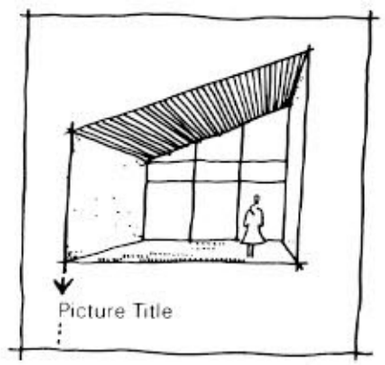


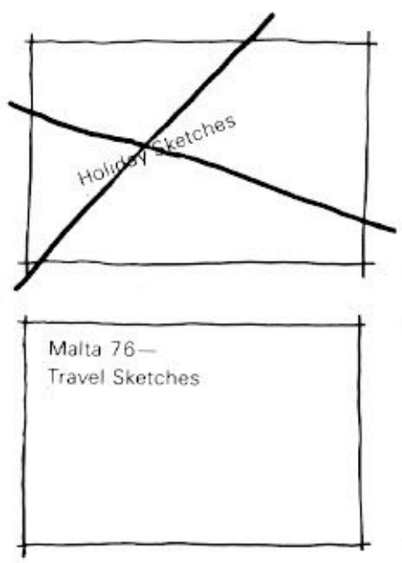
Note: Lettering should convey information and not be the cause of possible misunderstanding.

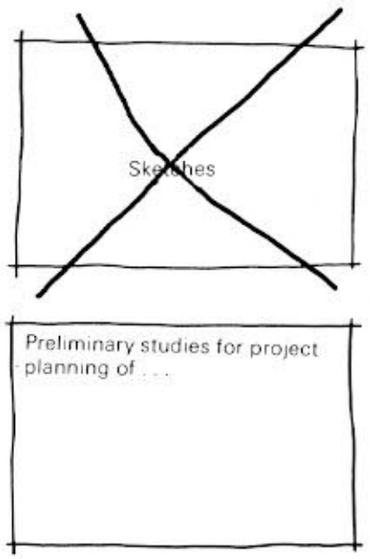
Figure 7.13 Lettering Positions

These examples give some idea of how to arrange lettering or titles on all types of drawings.

For sketches, lettering should start in the bottom left corner.







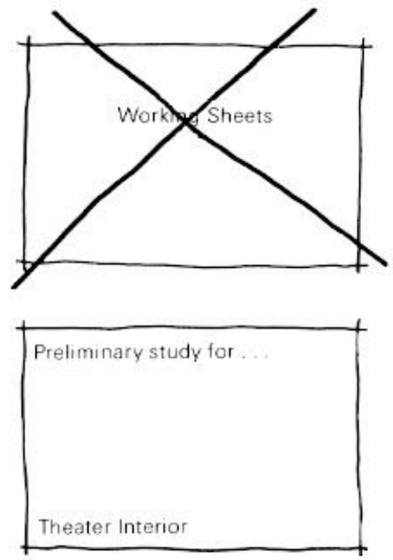
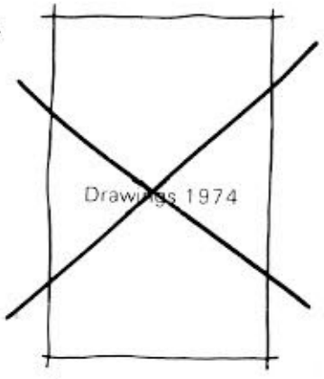
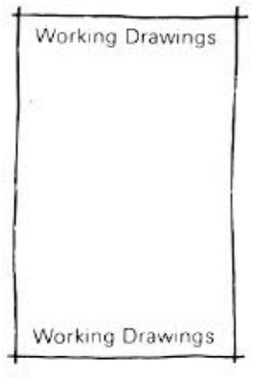


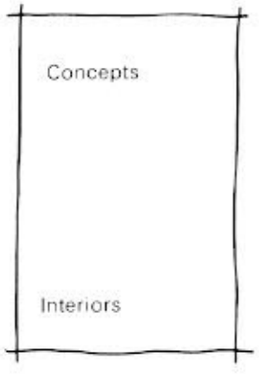
Figure 7.14

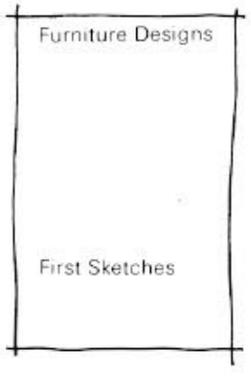
Lettering of freehand drawings, title pages, posters, cabinets, doors, etc. (good and bad examples).

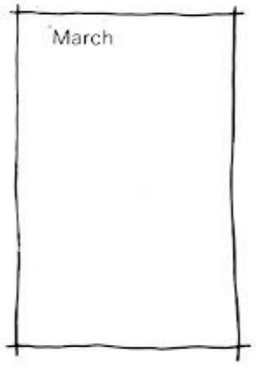
Please work with large, white, and well-ordered spaces that will relax and compose the eye.

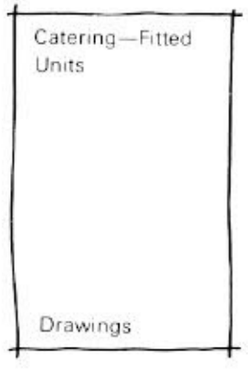












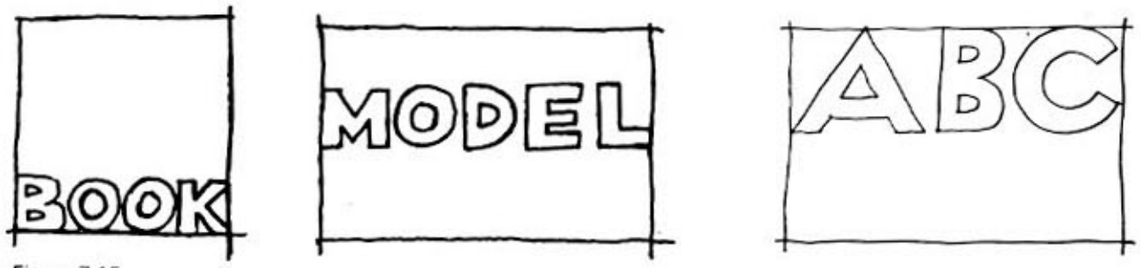
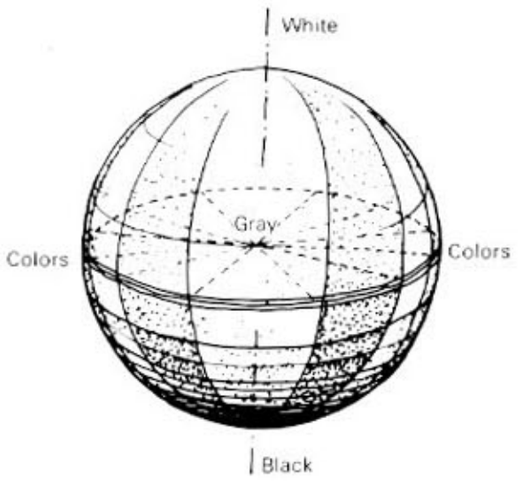
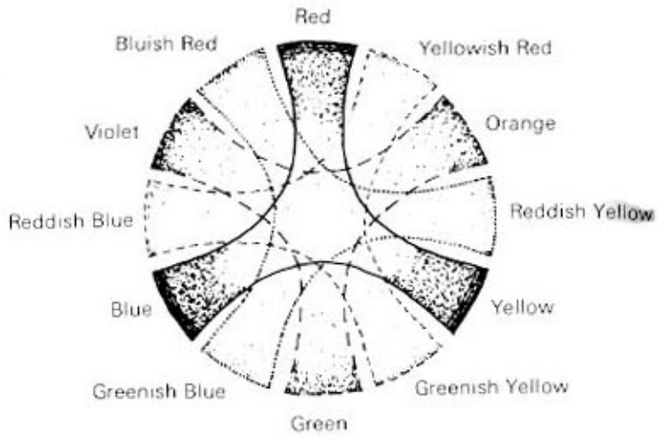
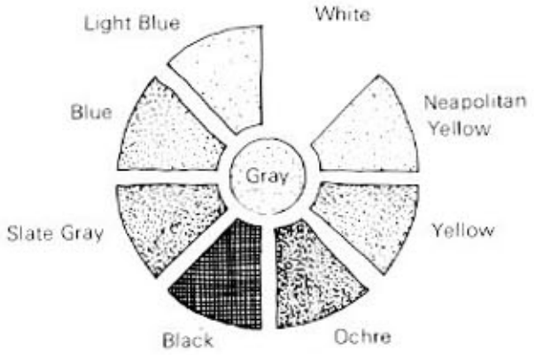


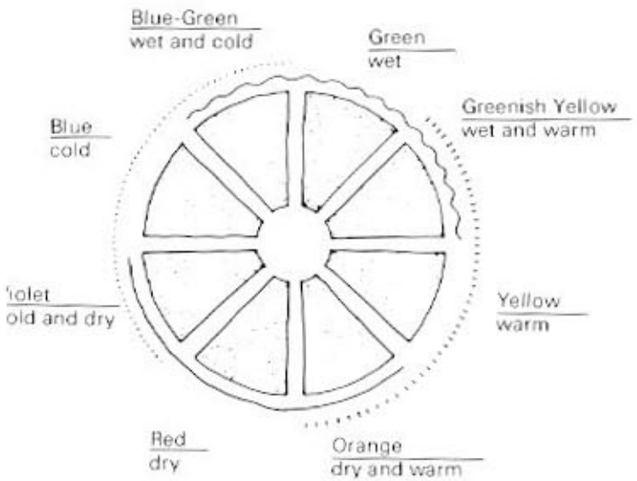
Figure 7.15

Lettering in shop windows, display cases, etc., should be large enough to be read by passersby from a distance.









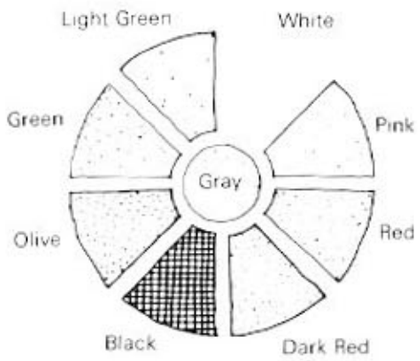
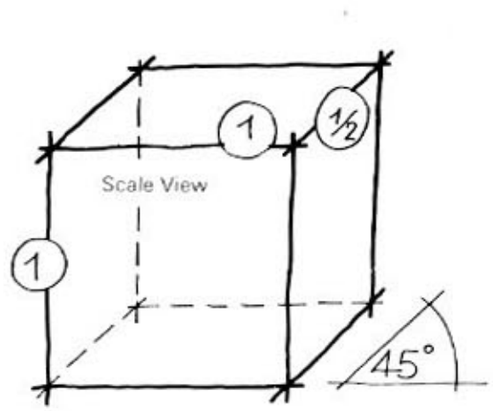


Figure 7.16 Examples of Lettering (from Heuser, *Interior Architecture and Design*, Vol. 1, Bauverlag, Wiesbaden)

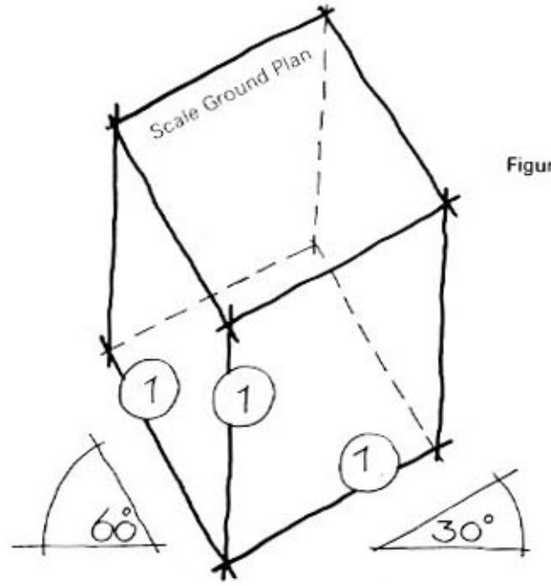
8.0 Drawing Solids and Spaces

8.1 Isometries

For relatively small and not-so-detailed parts of solids and structures, one suitable method is to sketch views of solids and spaces from different angles. This method is especially useful for very rapid drawings, and isometries have proven to be of immense value for explanatory drawings in mechanical engineering. The more demanding, experienced draftsman, on the other hand, will reject isometry on grounds of imprecision and "unreality," in favor of the more professional and more expressive perspective drawing. This is why the most frequently used isometries are shown only briefly here. There are four typical methods, all of which distort depths to a greater or lesser degree. A little intuition and imagination will prove that these methods give a natural impression to a very limited extent.

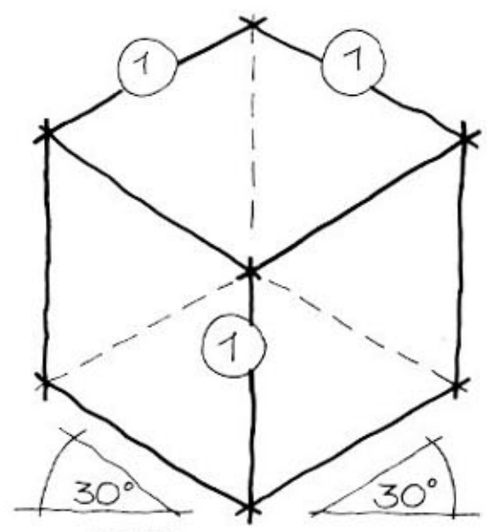


Cavalier Perspective

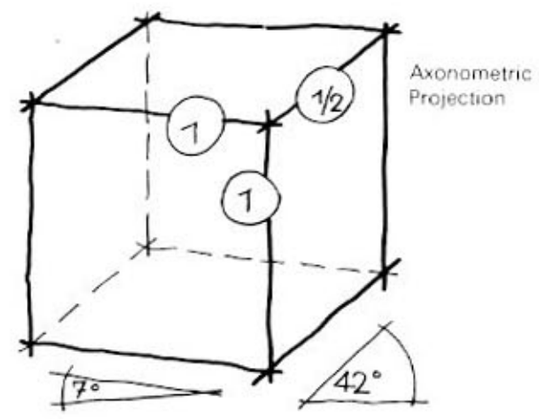


Ground Plan Isometry

Figure 8.1



Isometry



Axonometric Projection

8.1.1 Example of Isometric Projection (soundproof window)

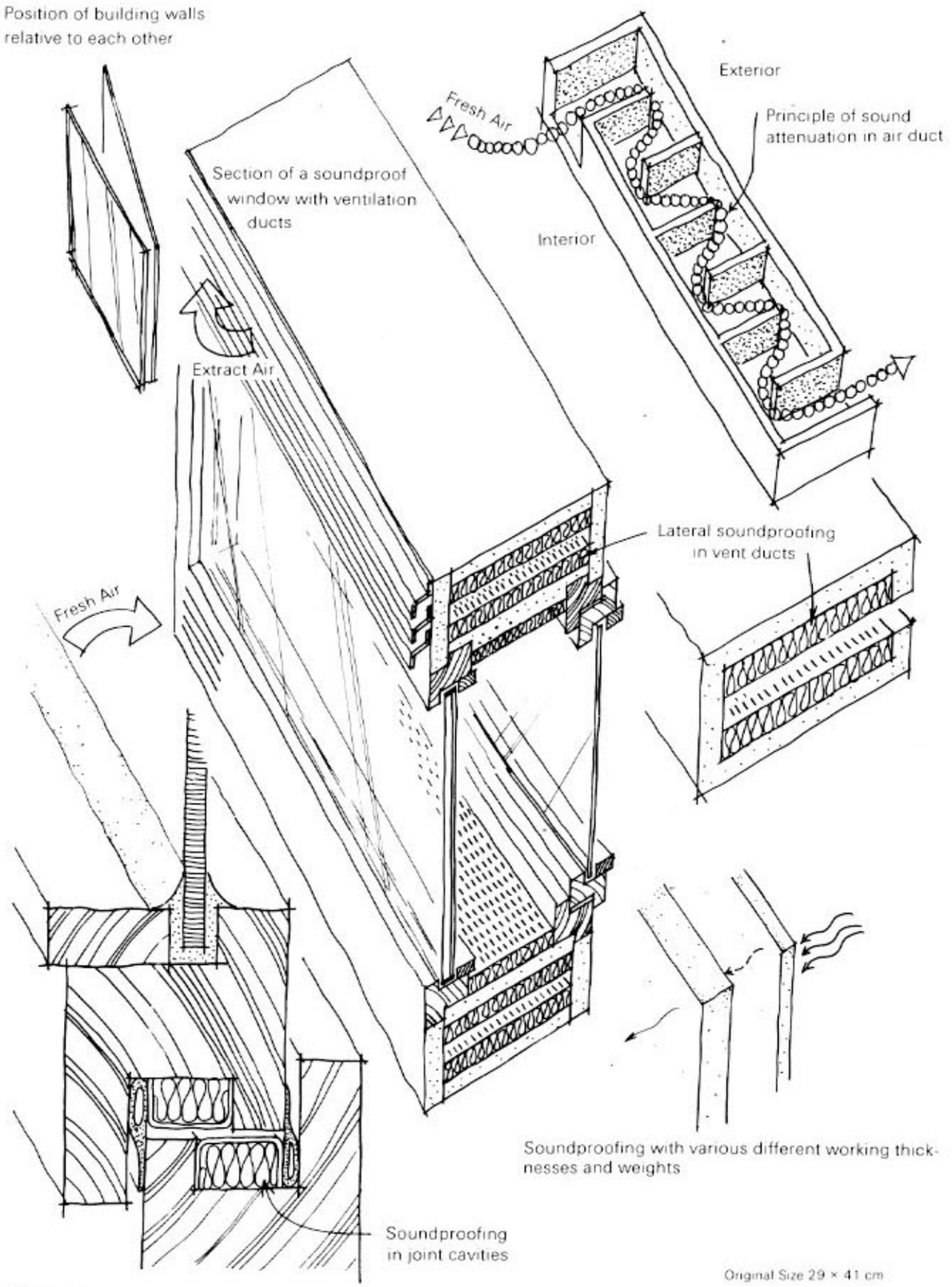


Figure 8.2

8.2 Frontal Perspective

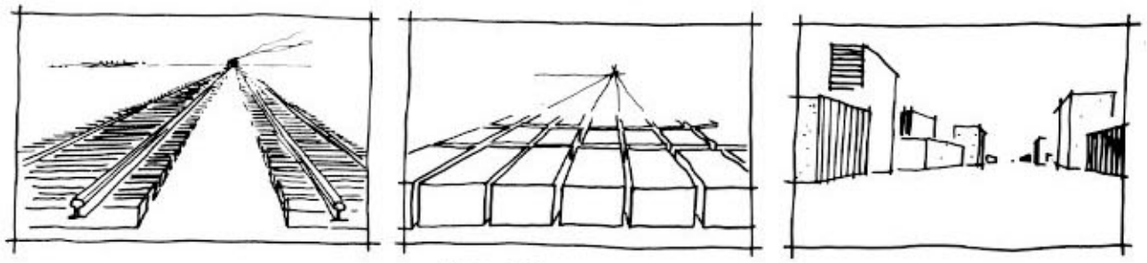


Figure 8.3

We shall confine ourselves to a few basic comments regarding perspective insofar as it is useful for freehand drawing, i.e., the drawing of projects, buildings, and environments.

8.2.1 Construction of Frontal Perspective

8.2.2 Sightline and Picture Plane

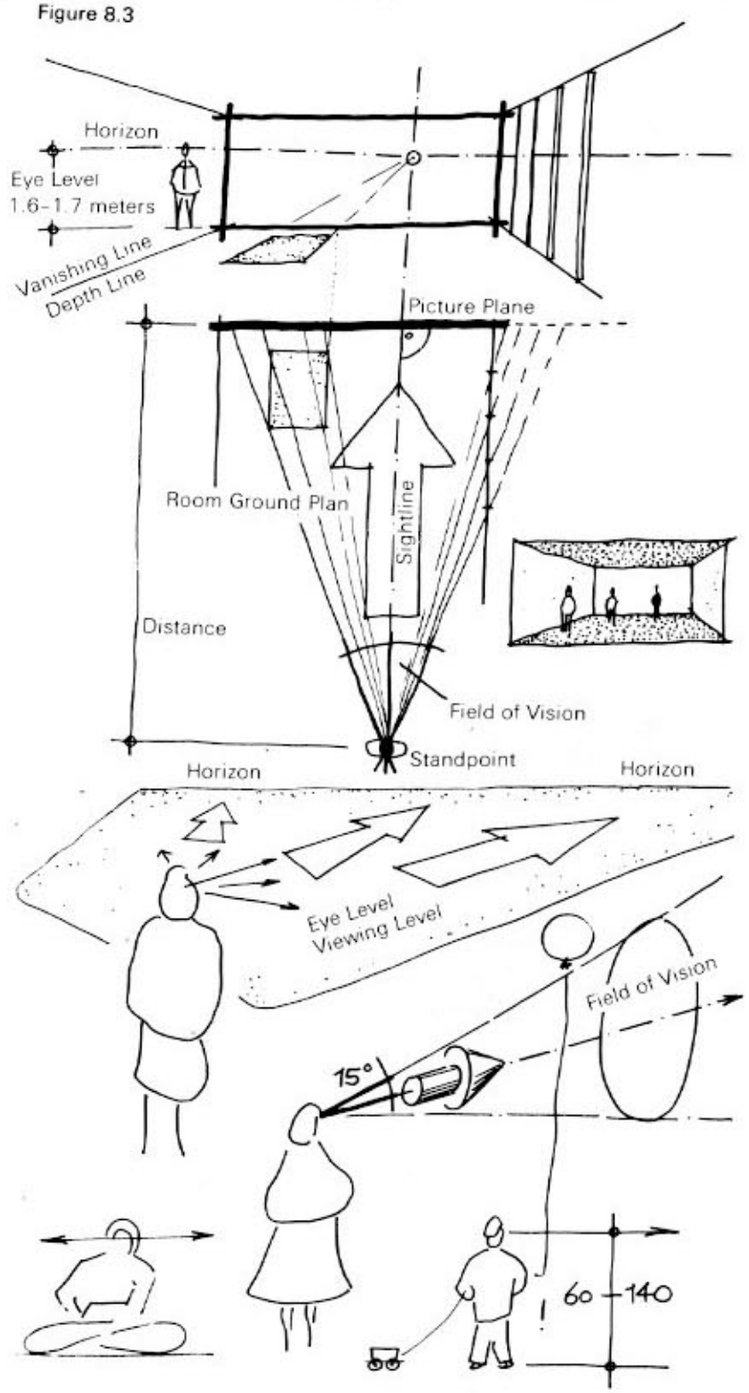
The essential element of this type of drawing is that the sightline strikes an absolutely vertical wall at right angles. The picture plane (drawing block, paper, picture surface, etc.) lies exactly parallel to the wall. The picture plane of the perspective is always perpendicular to ground level.

8.3 Terms in Perspective

All horizontal lines of walls, floor, or grids come together at a vanishing point somewhere in the distance (railway-track effect). This vanishing point always lies on the horizon, a fact which will be realized with a little thoughtful observation.

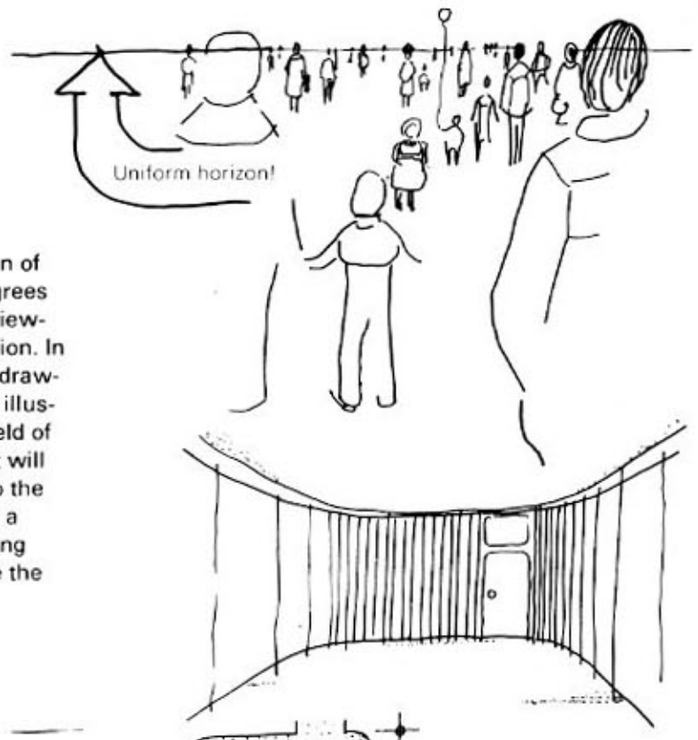
8.3.1 Horizon

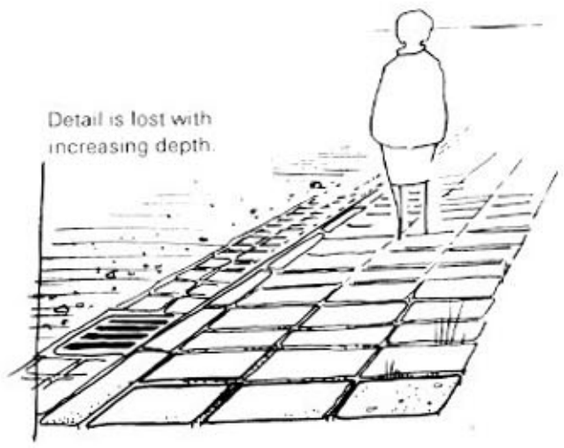
The sight horizon is taken to be all around us at eye level. All verticals (perpendicular lines) will also appear in the drawing as vertical.



8.3.2 *Field of Vision*

It is well known that the normal field of vision of the human eye only reaches to about 15 degrees either side of the axis of vision. Within this viewing angle all objects are seen without distortion. In order to avoid undesirable distortions in our drawings, therefore, we must make sure that our illustrations are of things which lie within this field of vision, since anything that projects beyond it will look unreal and comical. To get as much into the field of vision as possible we should assume a standpoint in the extreme corner of an existing room, say, or in the case of a design, outside the future room.





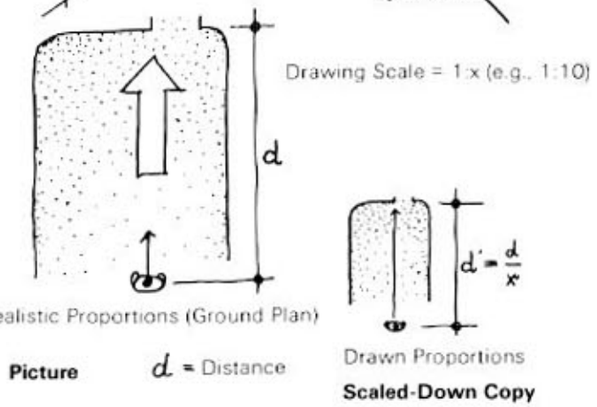
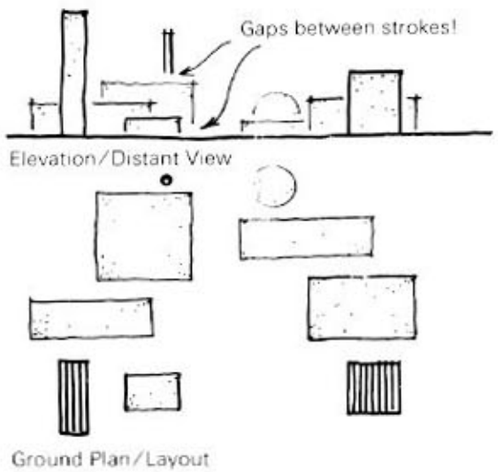


Figure 8.4



8.3.3 *Eye Level*

By eye level we mean the distance between ground or floor level and the height of the observer's eyes. On the average, people standing or walking have an eye level of between 1.6 and 1.7 meters. When a drawing is to include people as well as things, their heads must be on the same level irrespective of whether they are in the foreground or in the background. Since all vanishing points are always on the horizon (at eye level) the first priority is to draw in the horizon line.

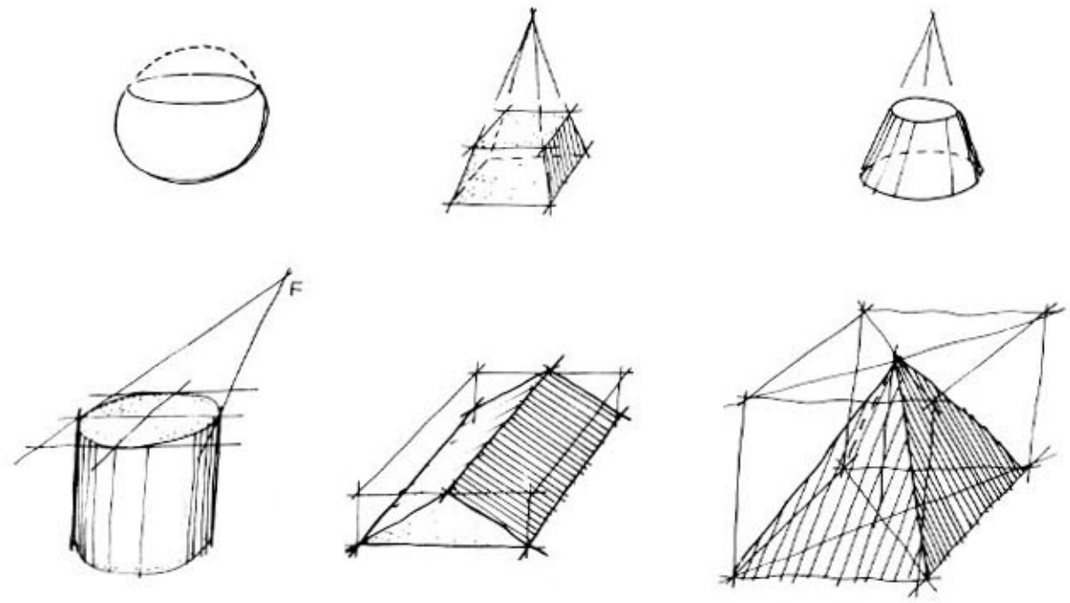
8.3.4 *Distance*

An impression of depth and scale is also achieved by putting people in the foreground and middle ground of the picture.

The "distance" in this case is that between the eye (standpoint) and the picture plane. In order for an image in a drawing to look more or less real, the observer should, in theory, be the same distance from the drawn object as the draftsman himself when executing his drawing.

8.3.5 *Drawing Density, Depth, and Outlines Close-Up*

Things close to us are always clearly visible and must therefore be drawn more precisely and with more detail. As depth in picture and space in-



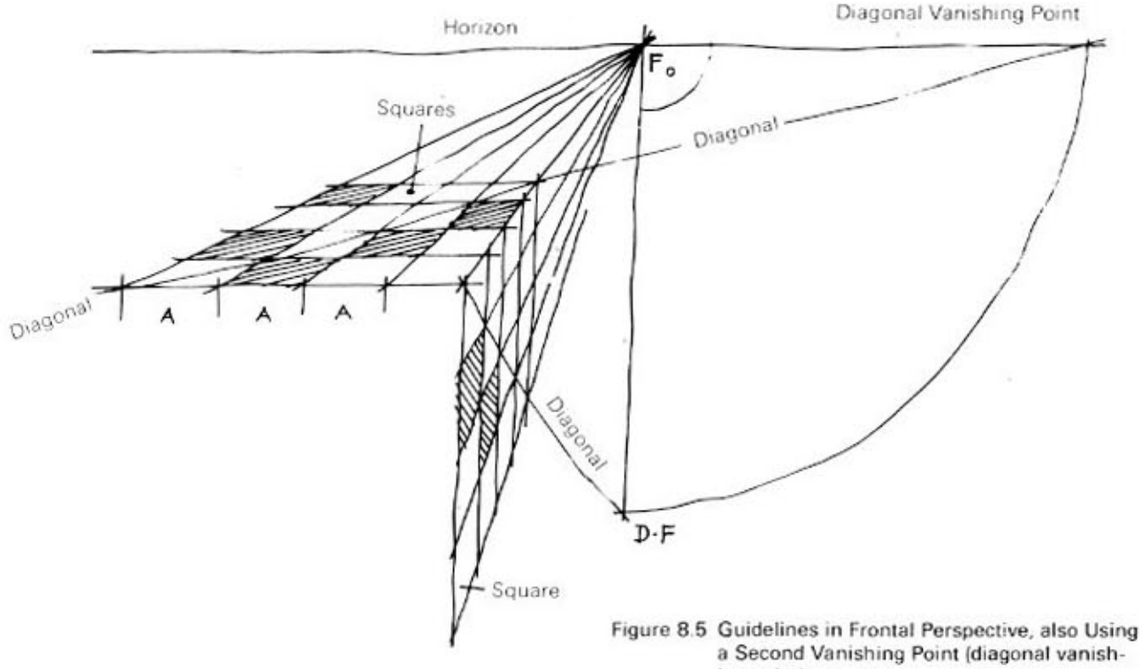
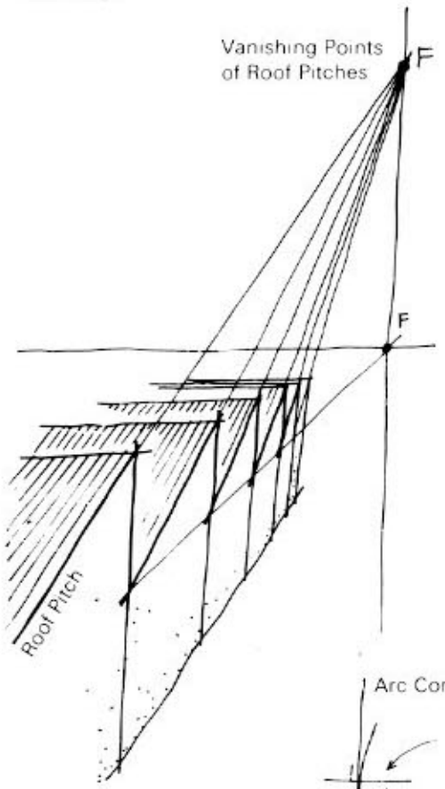
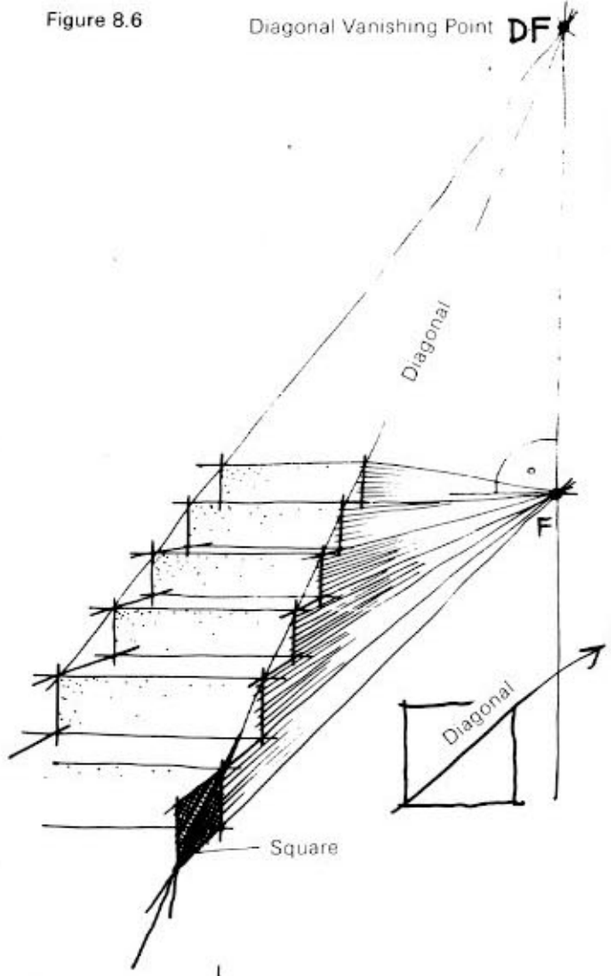
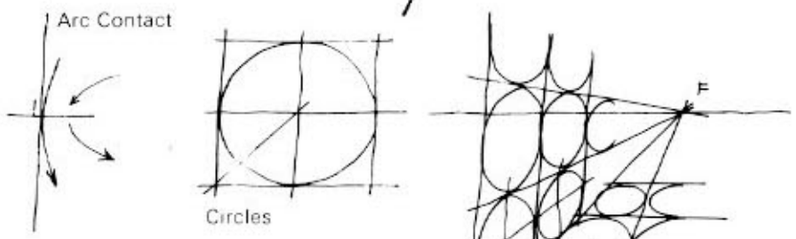


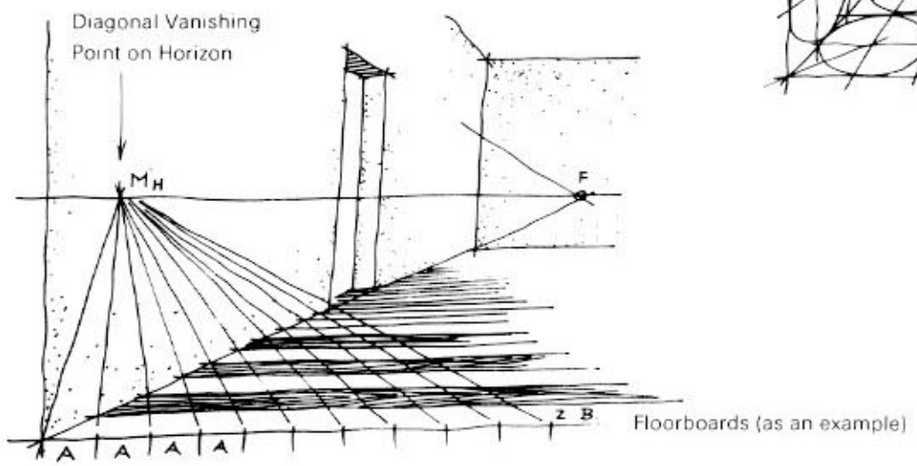
Figure 8.5 Guidelines in Frontal Perspective, also Using a Second Vanishing Point (diagonal vanishing point)

creases, so clarity and sharpness of outlines diminishes, as does light and color intensity; this means that as spatial depth increases, all objects must be drawn lighter (both in weight and color) and with thinner lines, otherwise the illustration will lose all credibility as a representation of reality. The outlines of objects shown at different depths should never run into each other but should end at a distance from images that are close-up.









Floorboards (as an example)

Figure 8.6

8.3.6 Foreground—Middle Ground—Background—Picture Depth—Contours

Illustrations of spaces of great depth can be divided into the following areas of perceptibility and reproducibility: foreground, middle ground, and background. A proper grasp and understanding of strong and weak optical impressions makes it possible to achieve the appearance of varying depth by graphic devices. If you are not sure of drawing the correct outlines or shadows, it is worthwhile partly closing the eyes for a second in order to determine the really essential outlines with strong contrasts. One should start by drawing the essentials.

If there is still some doubt about three-dimensional drawing, we suggest the following method as a temporary aid to attain more feeling for freehand, spatial drawing: select a drawing that you admire and trace it line by line. You should of course take a critical look at each line and its meaning. For instance, ask yourself why a line is at a particular place or why the line is of a particular quality.

One should in any case beware of mindless copying in freehand drawing.

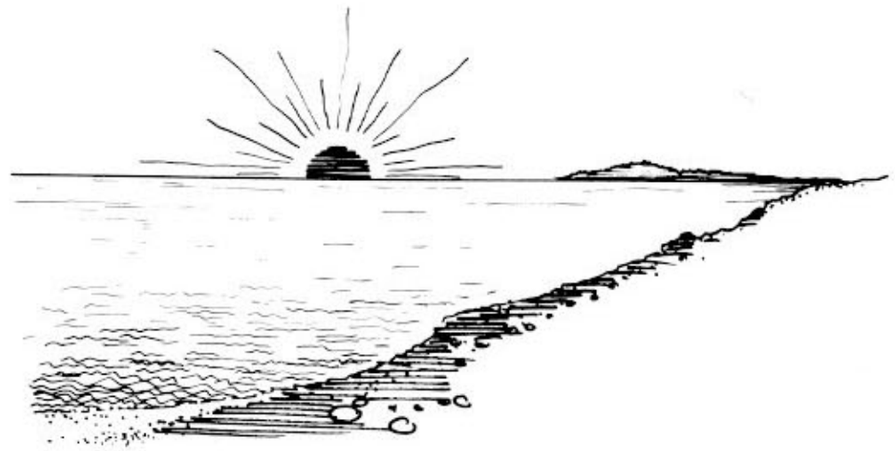
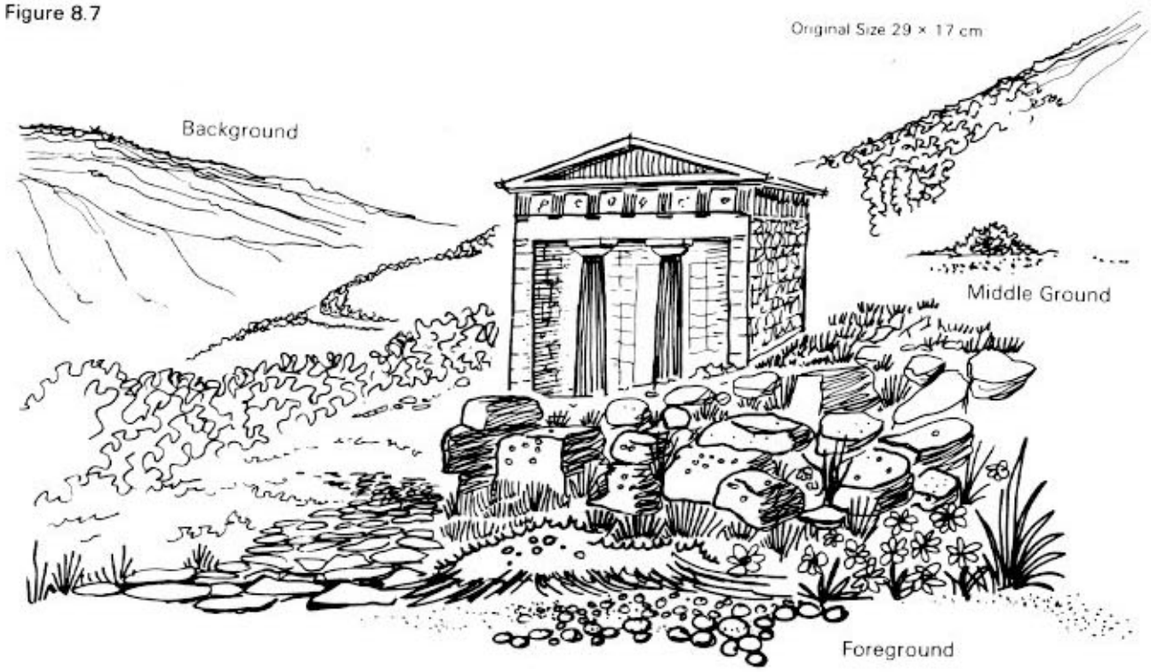


Figure 8.7



8.3.7 Shade

Whenever light plays a part in the spatial illustration of frontal perspective—which is often the case—it will be necessary to draw shade in order to enhance three-dimensional effect. Shade covers those surfaces which belong to the illuminated solids but which are actually averted from the light incidence. These surfaces lie in shade.

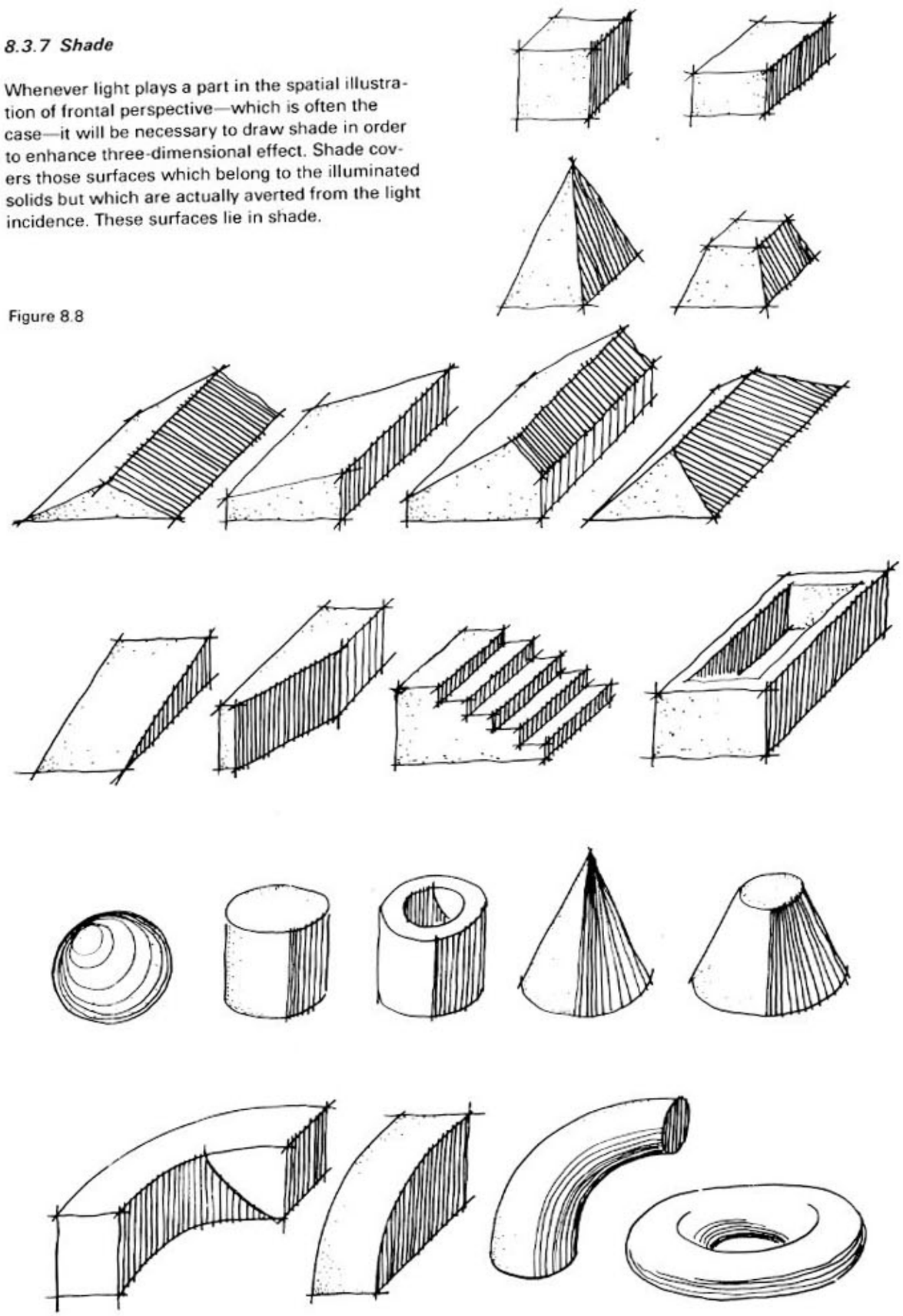


Figure 8.8

8.3.8 Cast Shadow in Frontal Perspective

Since edges that run completely parallel to the picture plane or that run away to a vanishing point cast shadows, the shadows of those edges must in consequence also be drawn parallel to the picture plane or back toward the vanishing point. The shadow is cast according to the position of the sun or light source. If for instance the sun is facing us, we can insert it into the picture plane (above the horizon line) simply by drawing the perpendicular from the theoretical sun down to the horizon line; we then locate the vanishing point for the shadow line and so obtain simple vanishing lines for the outline of the shadow. If the sun is behind us, we just have to assume a theoretical solar point below the horizon line and proceed accordingly.

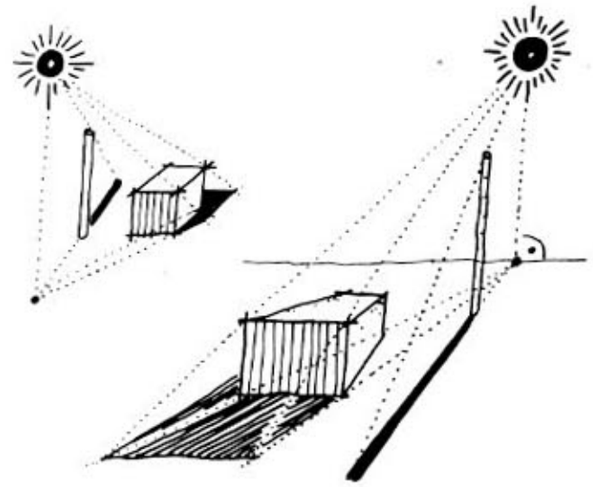
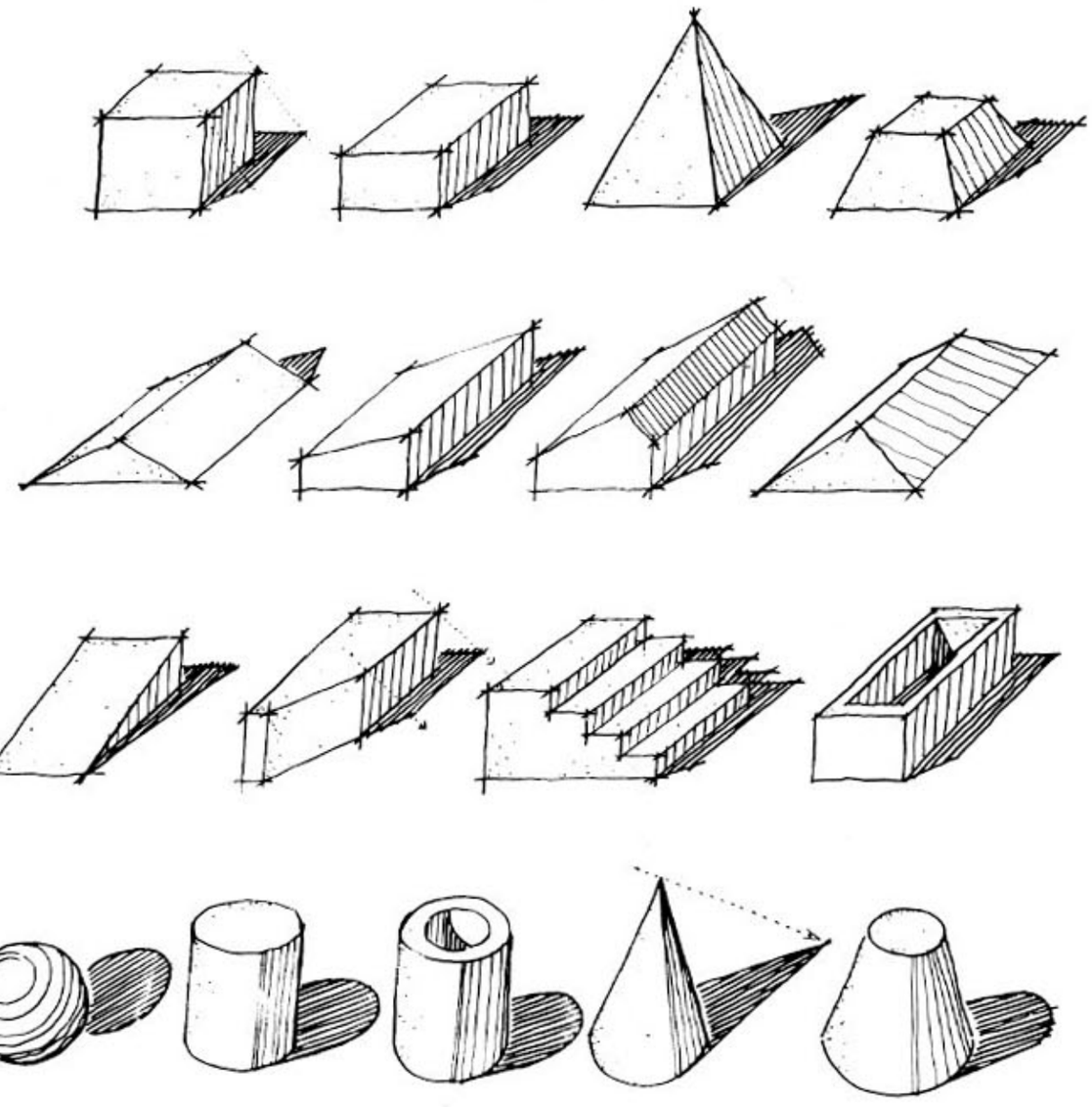


Figure 8.9



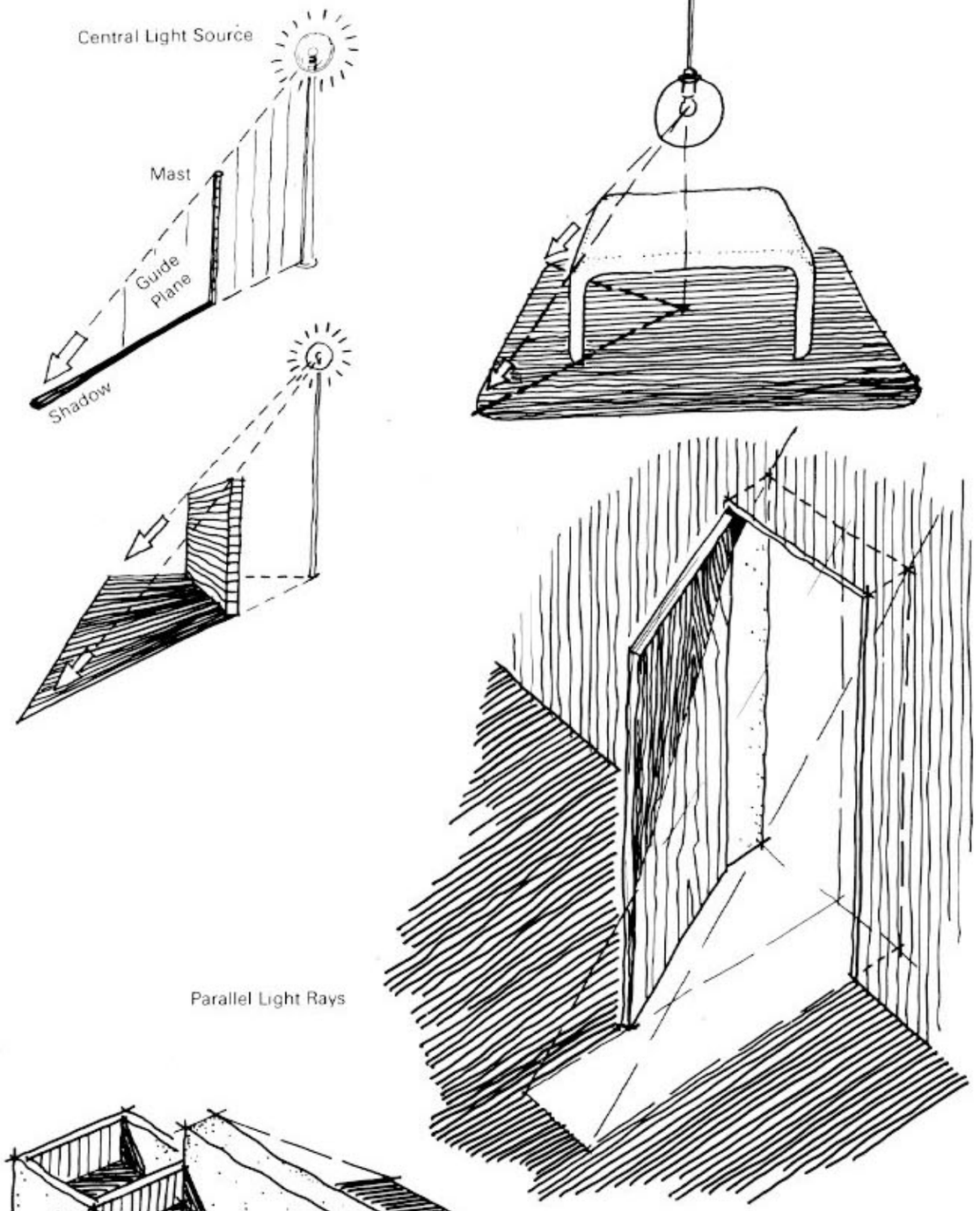


Figure 8.10

Special Case—Cast shadow on glazed surfaces:

Depending on the direction of illumination, glazed areas appear as light or dark surfaces on buildings seen from the outside, and must be drawn accordingly. As a general rule, in a very brightly lit facade the windows appears as dark areas (almost hole-like). A similar approach applies to a glazed area or window only partly lit by the sun and which thus lies partly in shadow.

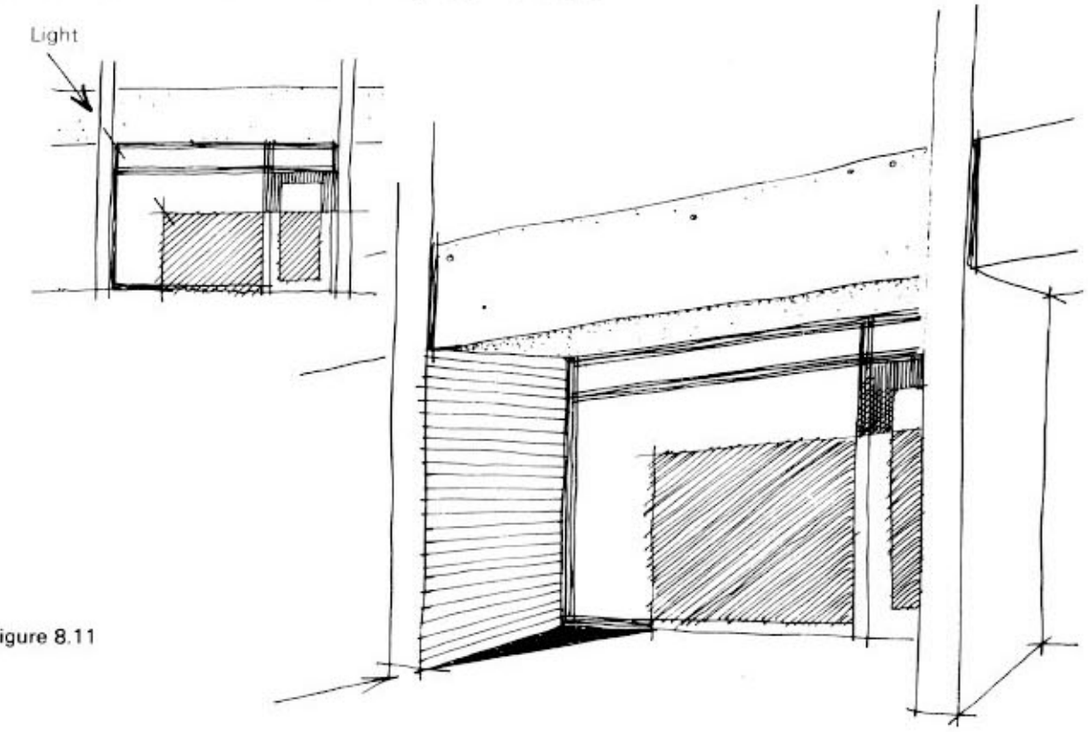


Figure 8.11

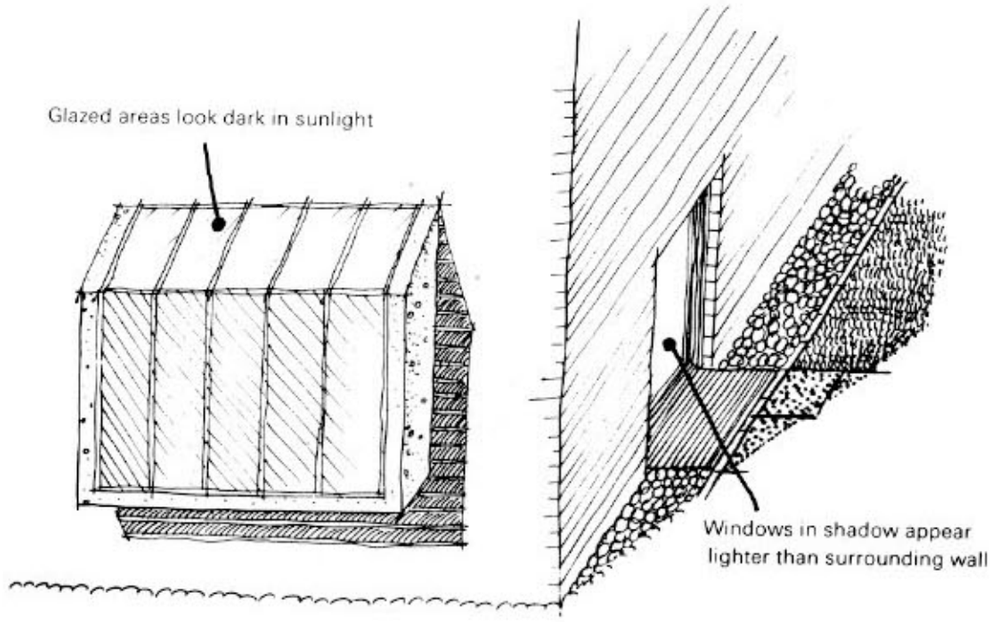
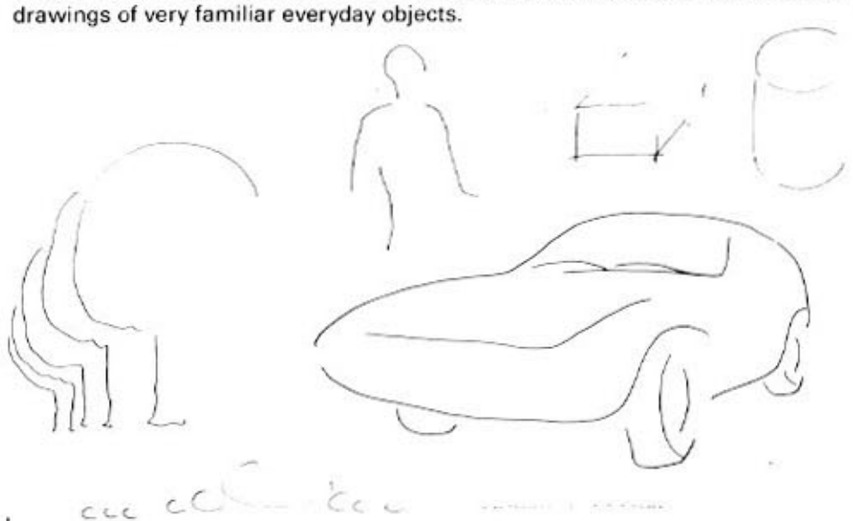


Figure 8.12

Special Case—Bright edges:

Another interesting case is the marking of the brightest-lit edges through the partial omission of their outline. When observing the picture, the eye completes the object for itself and only perceives form and brightness. As a rule these are drawings of very familiar everyday objects.



Original Size 21 × 30 cm

Figure 8.13 Brightly Lit Edges

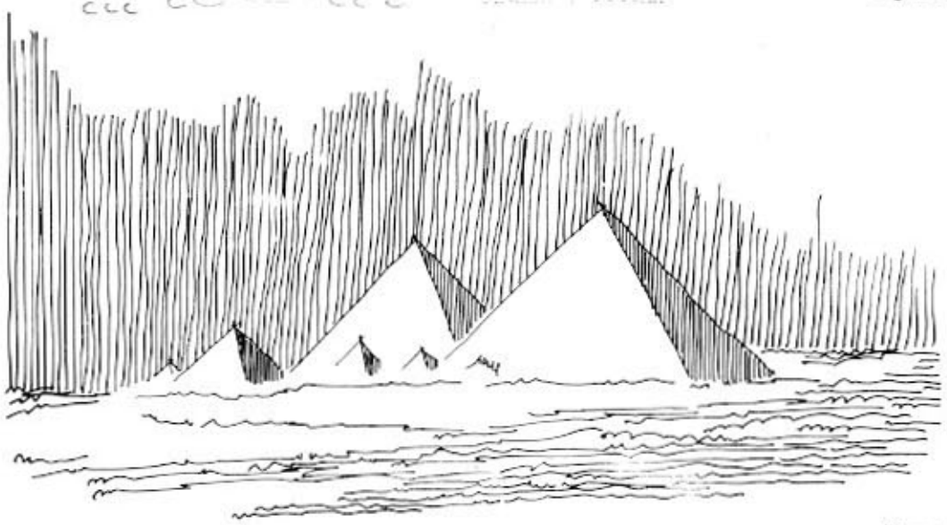


Figure 8.14 White Silhouette

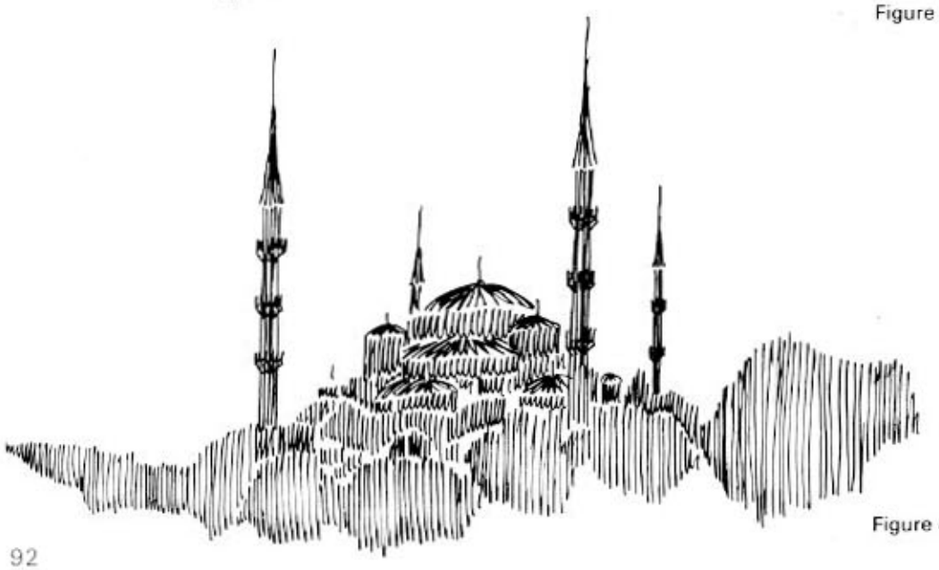
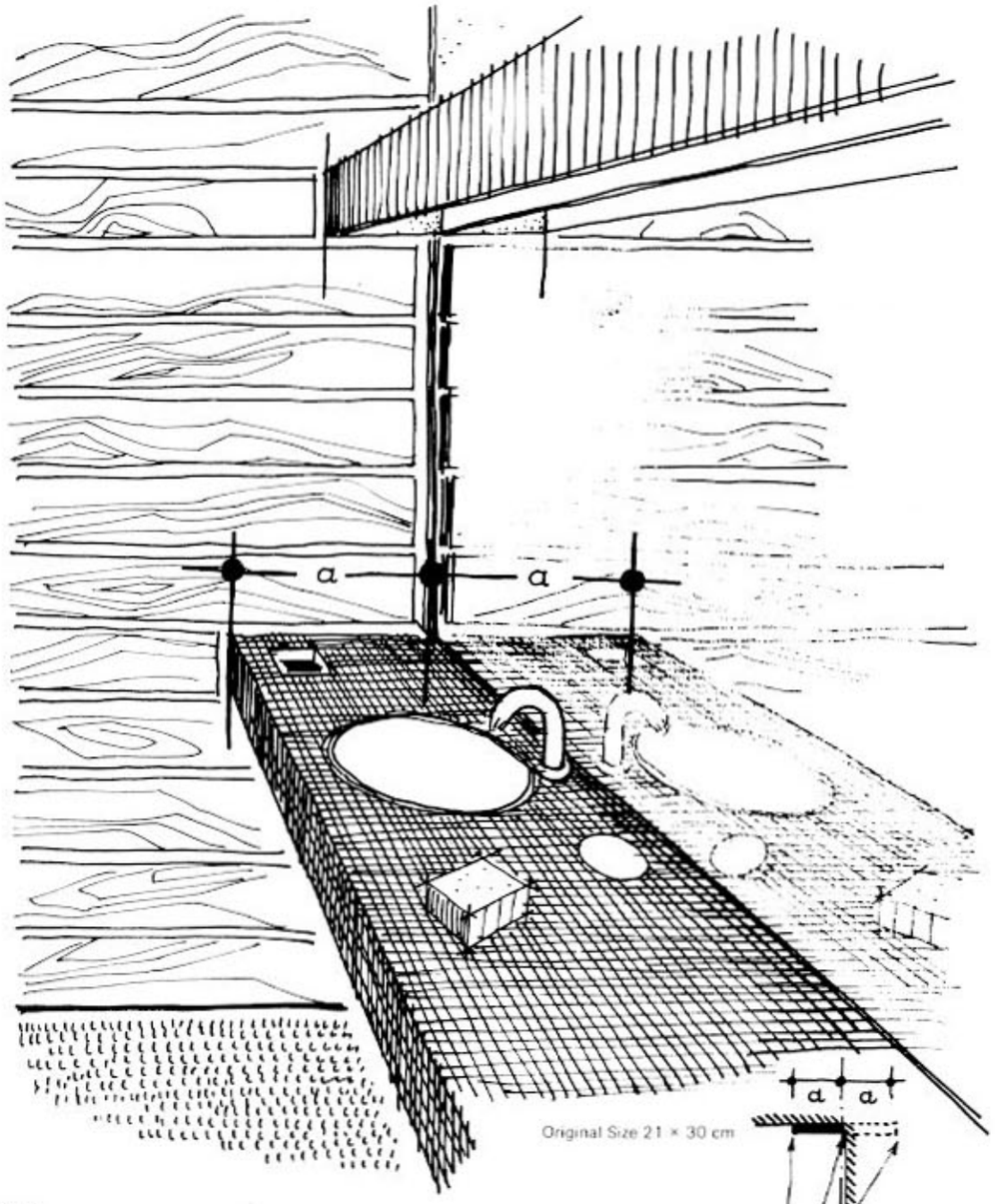


Figure 8.15 Black Silhouette

Special Case—Silhouette in front of dark and light background:

Two special cases resulting from very marked differences in brightness from sunlight or artificial light are the silhouette in extreme counter light (sunlight) and its counterpart, namely the illustration of a brightly illuminated object against a darker background (night or storm clouds, etc.).



Original Size 21 × 30 cm

Reflection—Mirror on Wall
(vertical mirror plane)

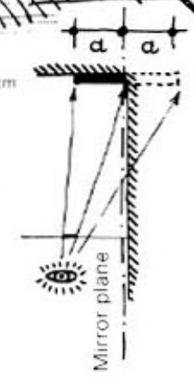


Figure 8.16

8.3.9 Reflections

Mirrors produce a true to life image turned about the mirror's axis; in other words, the mirror's surface reproduces things in their natural dimensions and distances in relationship to the given plane of the mirror.

Please note that a scene and its mirror image have a common vanishing point.

As unlovely as symmetry so often is, it cannot be ignored in mirror images. In this example the mirror's surface is the surface of the water. All dimensions and lengths are taken from the real objects and then "folded" through the given mirror plane to make the mirror images.

Reflection on Water (horizontal mirror plane)

Original Size 21 × 30 cm

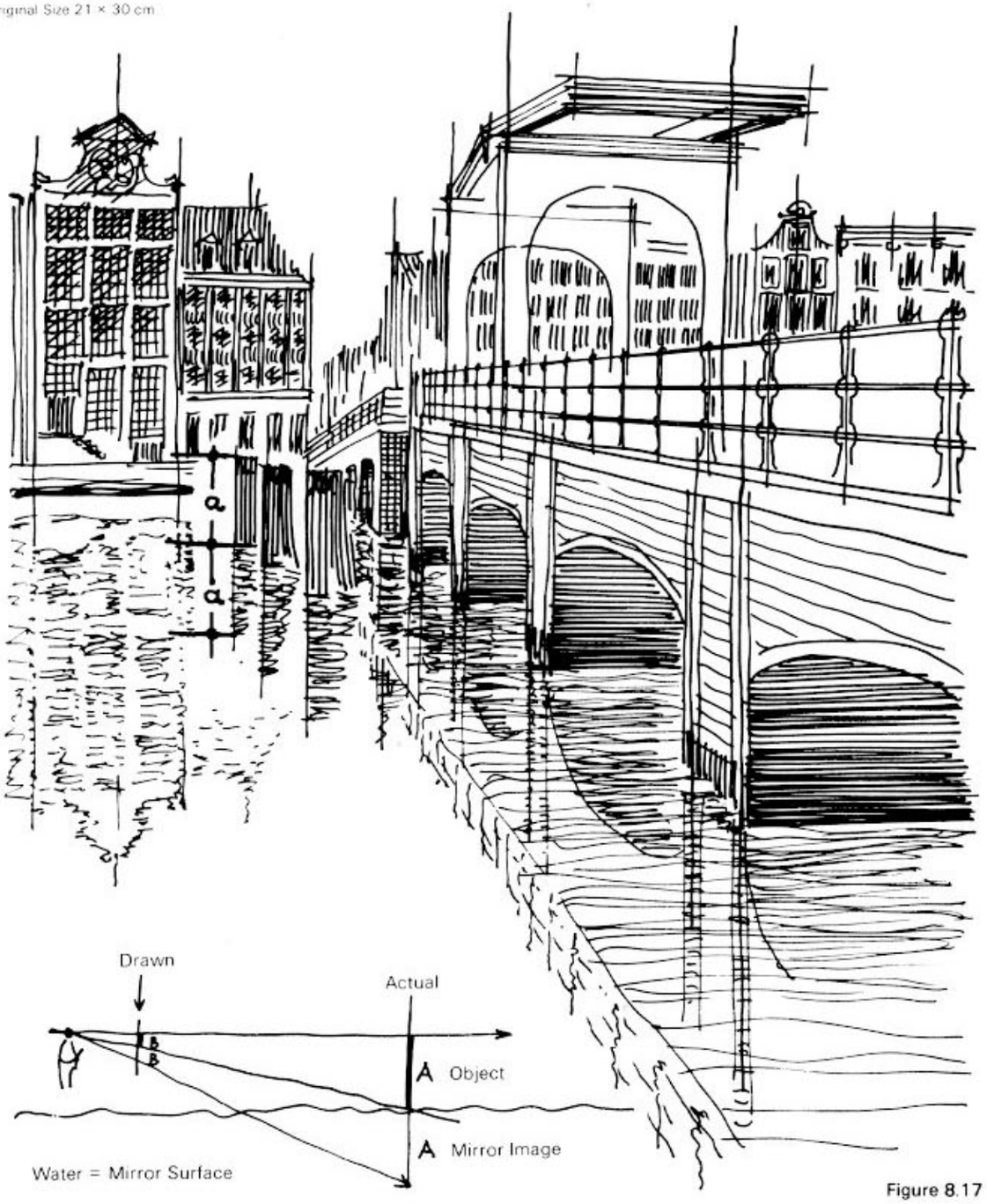


Figure 8.17

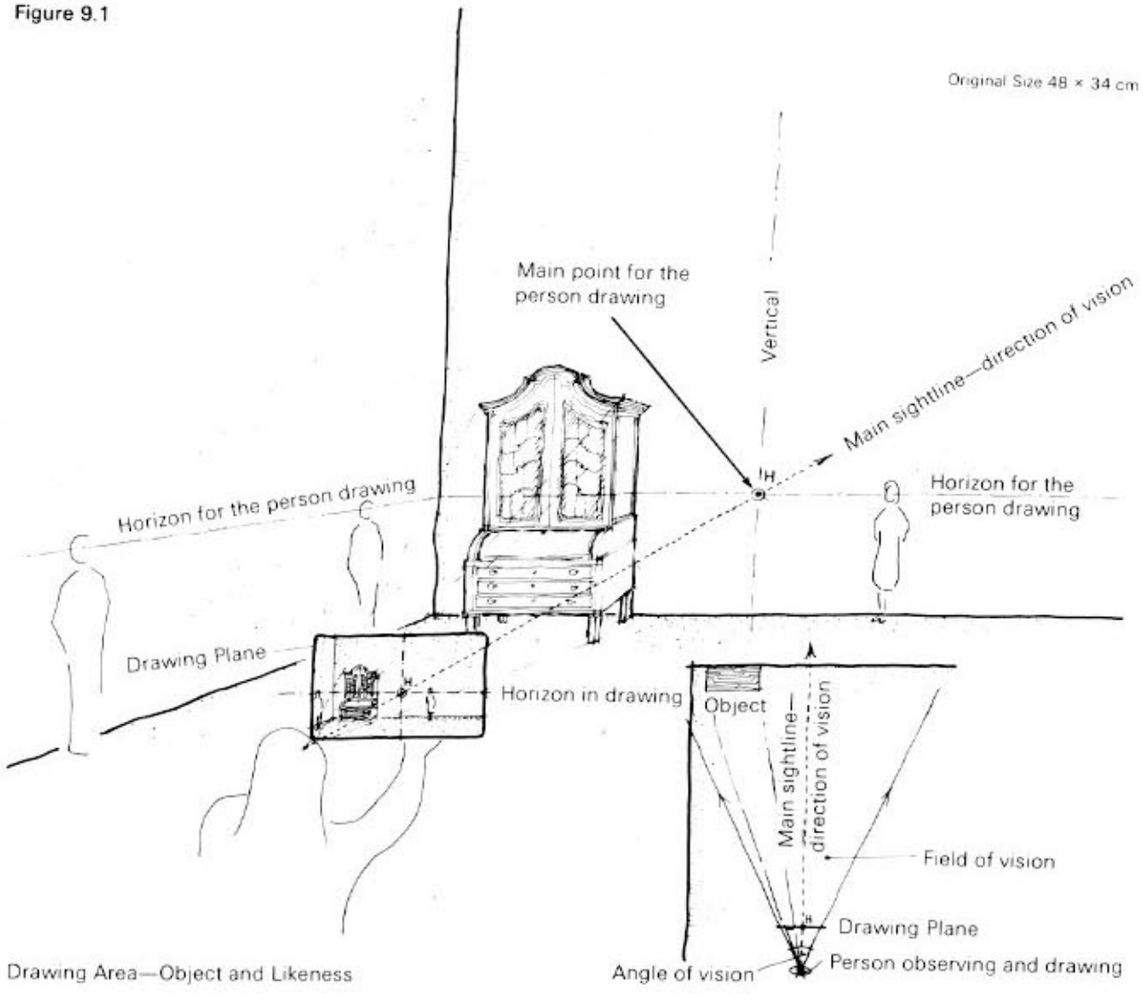
9.0 Central Perspective (Frontal Perspective) as the Likeness of an Object

9.1 Drawing Paper—Format—Detail

One important step in any introduction to this subject is the selection of a simple, see-at-a-glance motif. The picture's horizon plane as seen by the eye should also be horizontal in real life, so never draw with a falling sightline! When drawing, you should be at a distance from the drawn object that corresponds to the size of your drawing paper. Hold up the paper with arm outstretched in the sightline, then "take bearings" over the edges of the paper to see whether the particular detail you wish to draw has the right size and proportions. From what we have already said in previous sections, it is clear that we can fix a particular scale for the picture on the basis of our fixed standpoint and given length with our outstretched arm. Hold up the drawing paper once again and note the horizon line or, alternatively, hold up your pencil in the line of sight to find an exact location for the horizon. The next step is to mark the vanishing point; in central perspective this is the meeting point for all vanishing lines in the distance. We can now proceed with the remaining steps just as confidently, provided we think about them calmly: drawing the horizon, the first frontal upright surfaces and solids—as well as their vanishing lines.

Figure 9.1

Original Size 48 × 34 cm



Drawing Area—Object and Likeness

Detail

A small trick may assist when selecting the detail you wish to draw. Cut out a frame from heavy-grade paper or card of suitable size that fully encloses the finished picture format. Hold it out at arm's length and use it to find your exact motif. Make a mental note of reference points such as horizon level and left-hand or right-hand edge so that you will always be able to find the detail again.

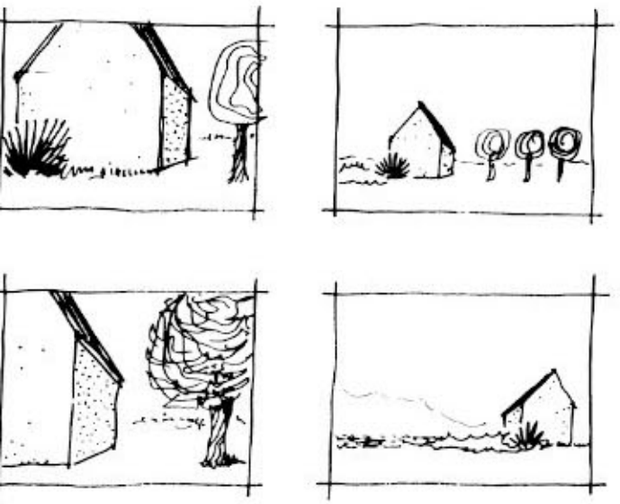
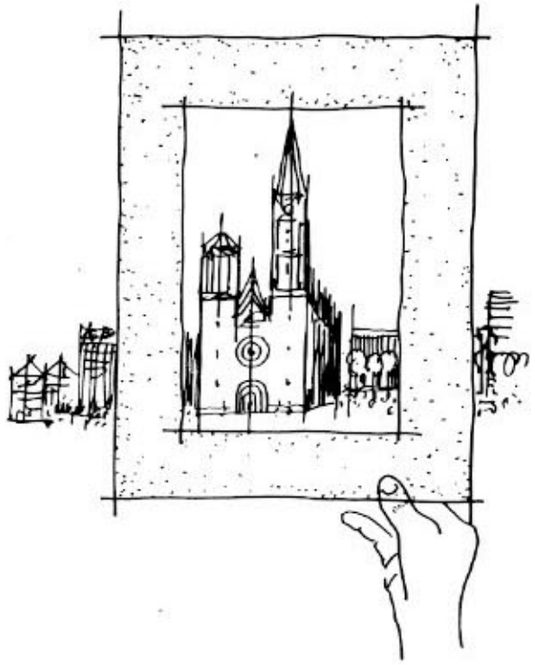
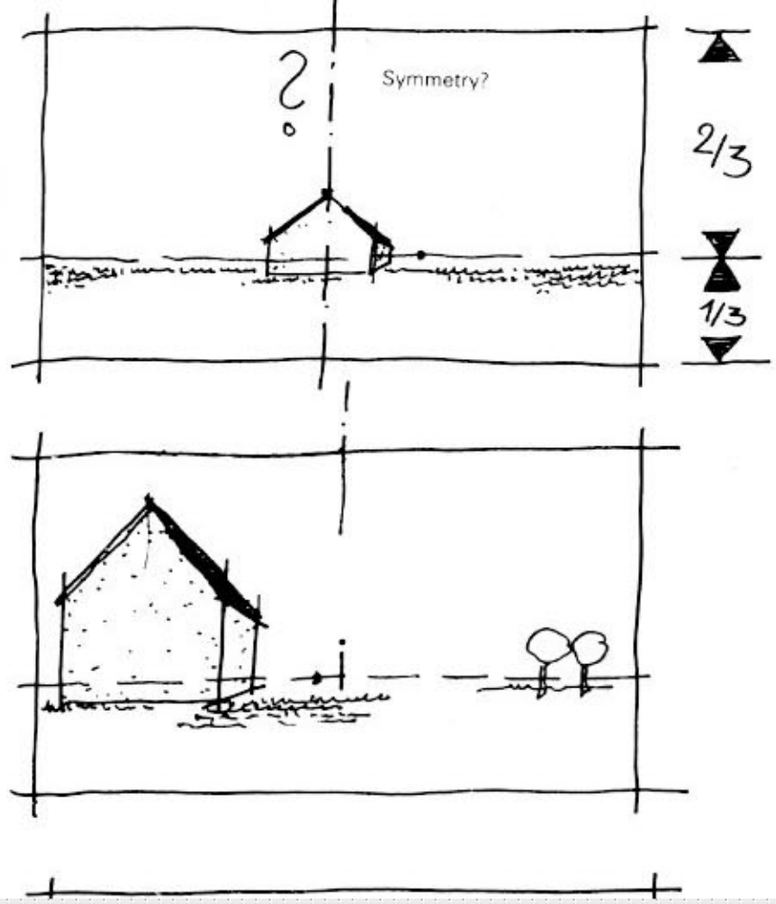


Figure 9.2



When choosing a horizon level for designed objects—i.e., objects which do not as yet exist in reality—one should be skeptical; the first solution does not necessarily make for the best likeness. Different horizon levels will of course produce dif-

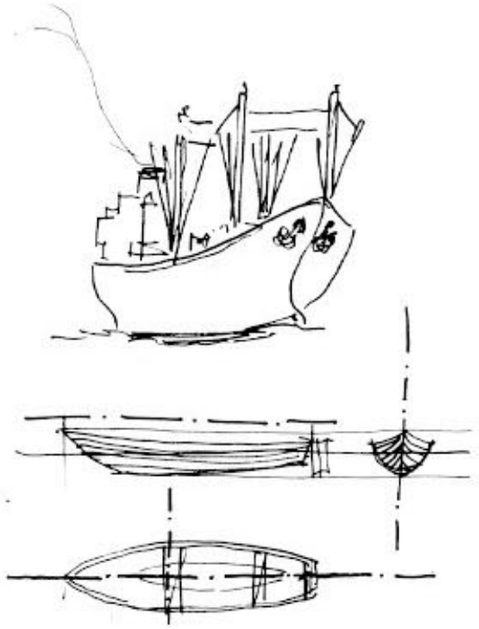


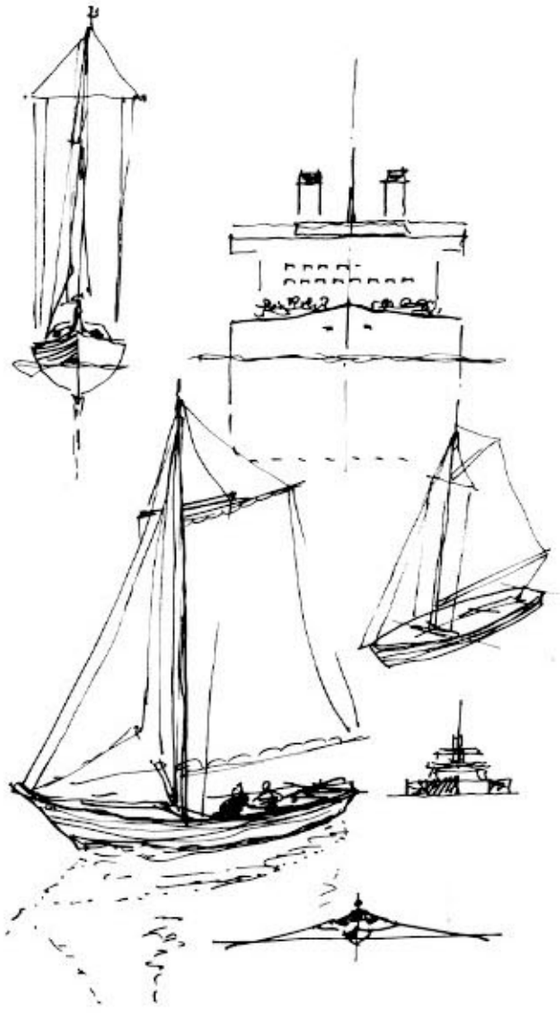
For the majority of outdoor architectural drawings the horizon can lie on the line of the bottom third, which leaves the top two-thirds of the drawing area available for the sky.

When drawing a building by itself it should not necessarily be right in the middle of the drawing. The resulting symmetry is boring in most cases.

15.0 Drawing Boats and Ships

The vanishing lines of watercraft may make it more difficult to perceive their exact and simple geometrical body lines than with cubes and parallelepipeds, but they are nevertheless solids that are governed by quite definite laws. Once the latter have been studied more closely it will be found that drawing boats and ships is not so hard. Generally it can be assumed that almost every hull has a fore-and-aft axis (centerline) which is usually an axis of symmetry. From the viewpoint of safety from capsizing and sinking, we can also suppose that the centers of mass and gravity are often in the center of the vessel and as low down as possible. Using the general rules of perspective, we can imagine hulls with transverse axes running





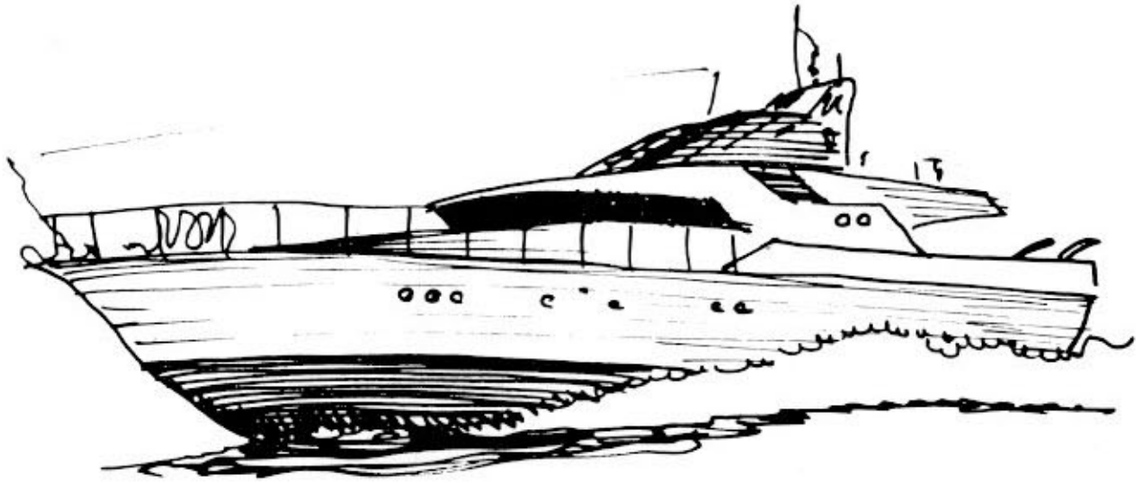
perpendicular to the centerline. It should not be so hard, therefore, to capture a vessel's attitude in a drawing.

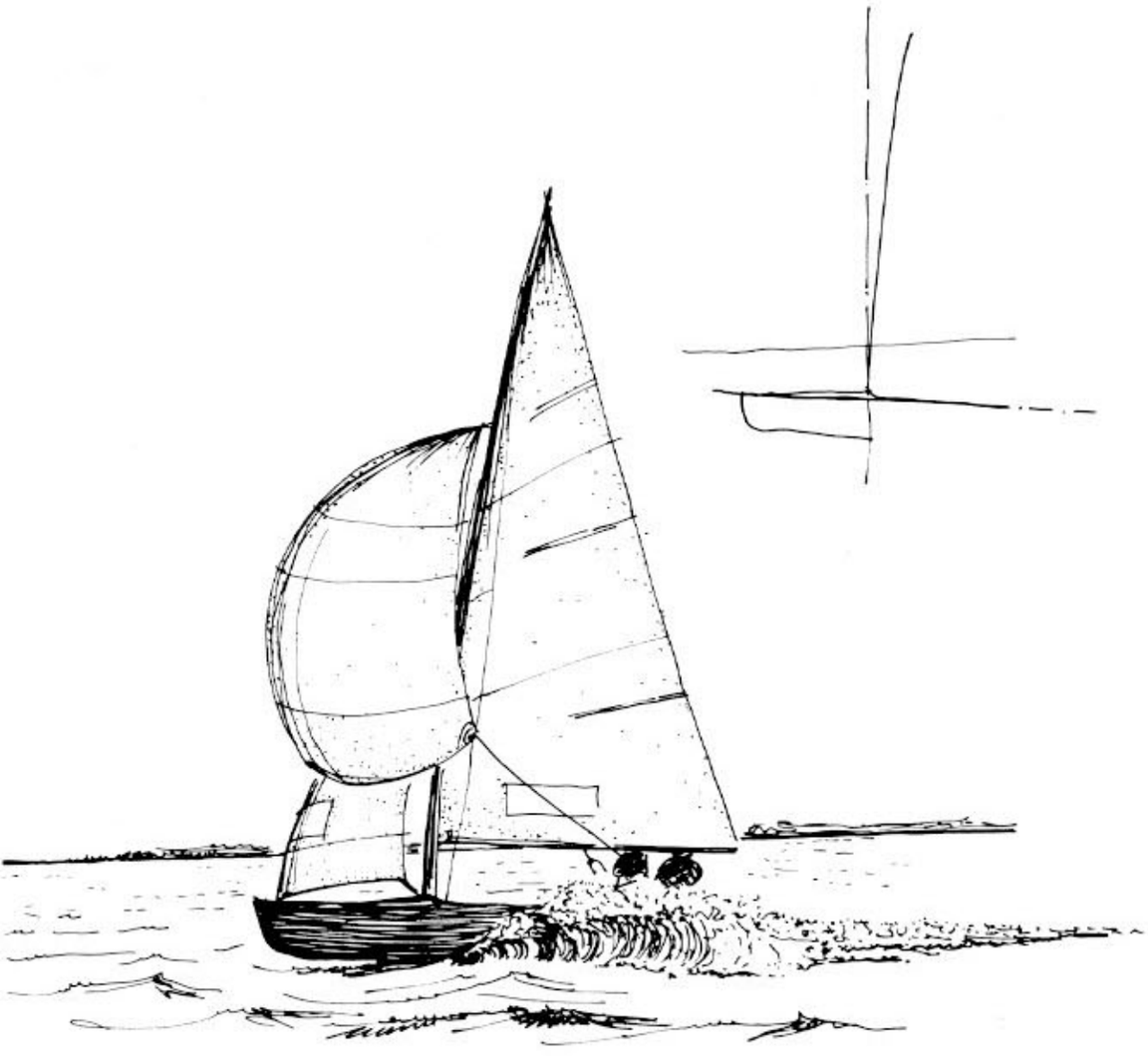
To become "acclimatized" it is advisable to begin with orthogonal drawings (ground plan, side and front elevations). The streamlined forms of lighter watercraft have an important part to play, while huge bulk carriers are built almost like long rectangular boxes. It is surprising, for example, to realize just how rectangular barges or tankers can be. Before starting to draw, it is important to become familiar with the object—the draftsman should "experience" it by walking (or sailing) around it. Then one must decide on the vessel's three-dimensional and structural breakdown. Finally, our knowledge of perspective will help us to draw foreshortenings and the entire body of the vessel. Even the quickest and best draftsman impresses the overall construction in his mind, then visualizes (perhaps in a split second) the three-dimensional implications.

Ships in their dominating attitudes and often isolated positions on calm seas can have great charm and attraction as subjects for our drawings; reflections in the water can complete the picture. The mirror axis is the water level!

Only the upper parts of the vessel need to be drawn as reflections on the water.

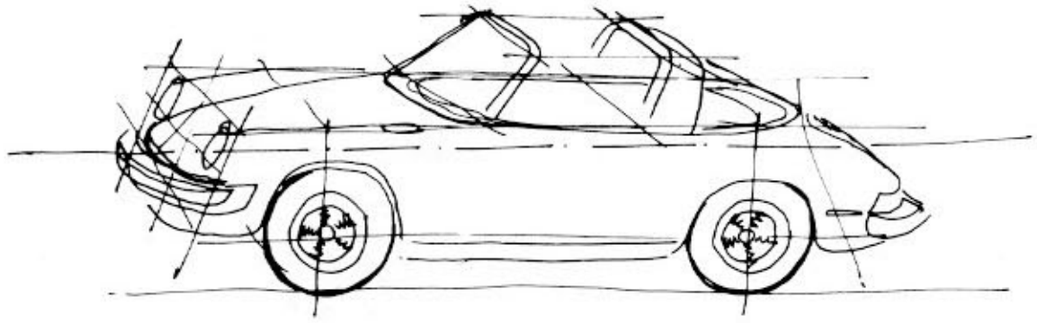
Land vehicles and aircraft have similar characteristics in their outward appearance, and so the same rules apply to them as to watercraft.

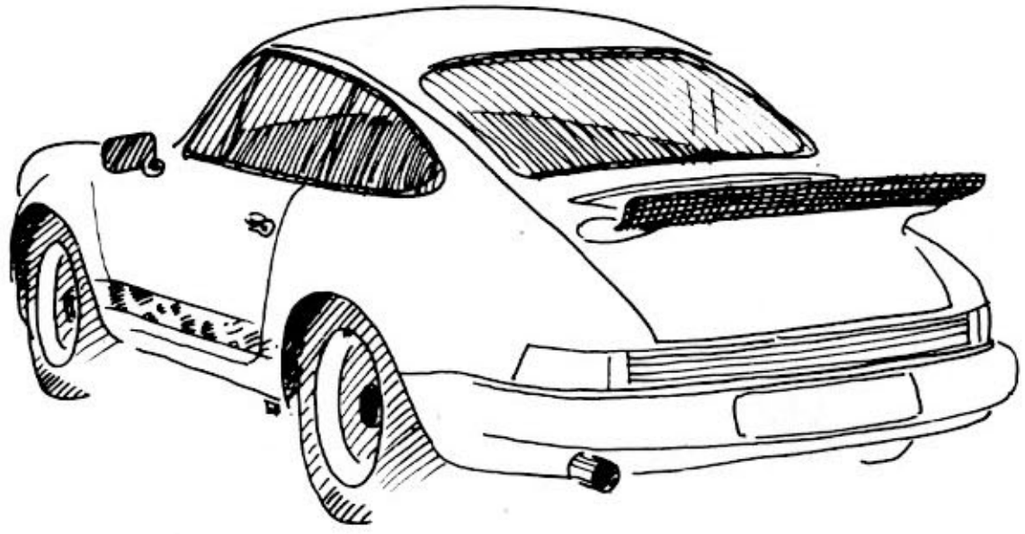


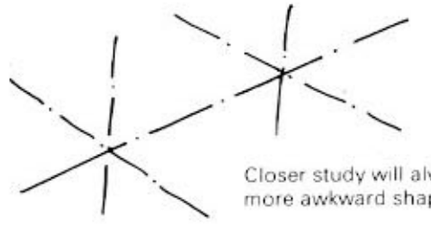


16.0 Drawing Other Forms of Transport

The better one is able to grasp all contours, especially the vanishing lines, before setting pencil to paper, the better one's drawings of land vehicles, aircraft, and marine vessels will be. Free curves which do not lie in planes that are perpendicular to each other can pose problems, and so it is frequently advisable mentally to insert reference shapes (sphere, cone, cylinder, annular ring, etc.) into the volume and then determine the boundary lines accordingly.

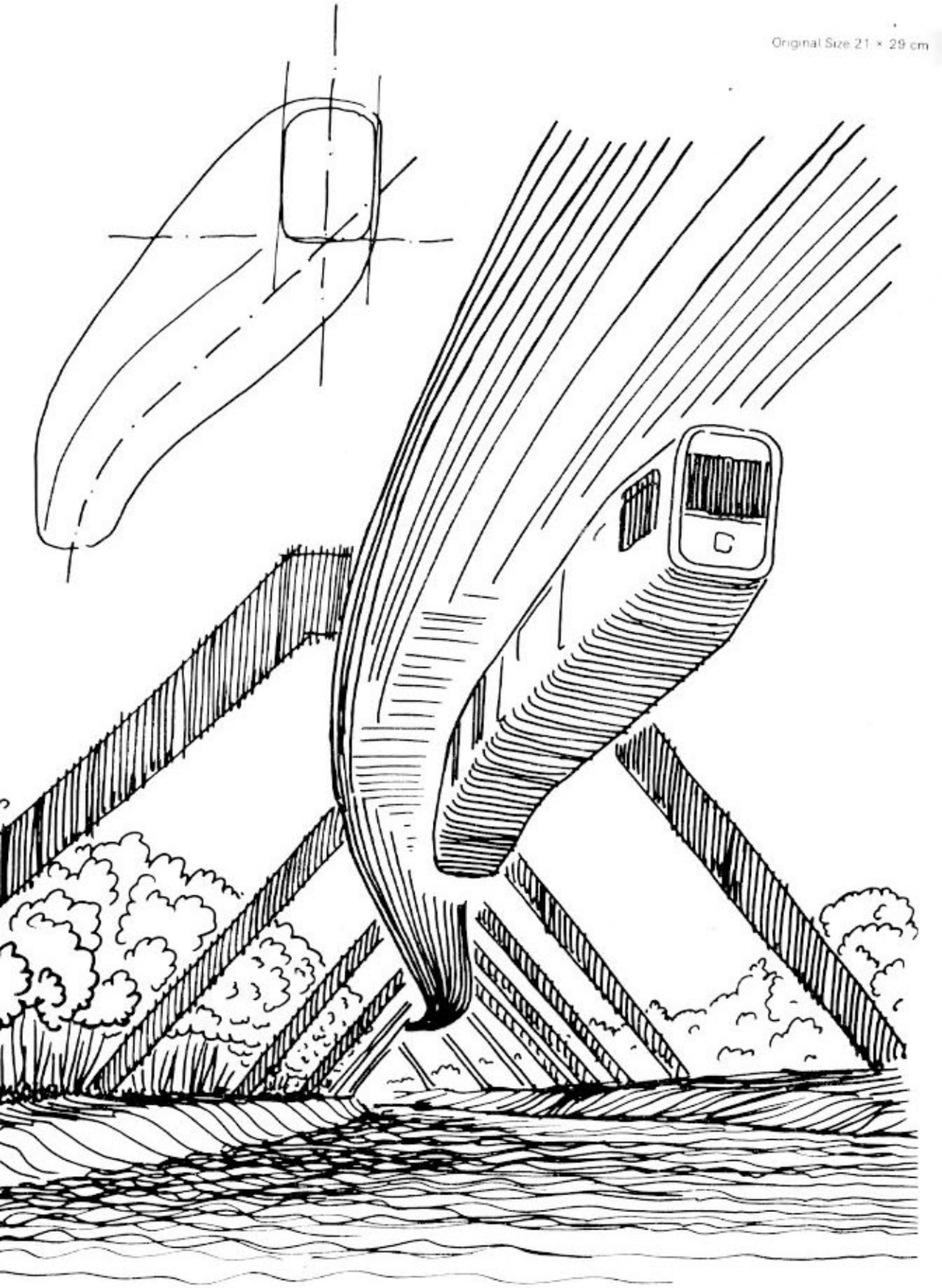






Closer study will always reveal reference axes for the more awkward shapes.

Figure 16.1 Elevated Railway



17.0 Drawing People

We shall confine our comments to the most essential principles.

Travel sketches, artists' and architects' impressions, street and garden scenes are always more expressive when they include human figures.

The specific aim of this section is to prevent otherwise successful geometrical drawings from being ruined by the inclusion of deformed human shapes.

Our eye level determines the actual human dimension for all our activities within the man-made world. Buildings, structures, parks, streets, and landscapes should always be matched to human requirements for attainability, accessibility, suitability, adequacy, etc.

If we assume a certain uniformity in human stature we may conclude that the individual parts of the human body are of uniform dimension also.

Since antiquity it has been customary to divide up the human proportions into eight equal parts, with certain parts of the body located at each subdivision. The length of the head from crown to chin may generally be taken to represent one-eighth. The sketches on this page give a rough indication of the main reference points. The reader is advised to take a sheet of paper and copy the divisions until he has fixed the sectional structure firmly in his mind; this will also help to avoid some typical mistakes. The neck for example must be set in such a way so that the head does not sit directly on the shoulders. In many sketches the head can be simply positioned above the body without any interconnecting lines. A wedge shape can be assumed for human bodies—in rough terms—and this begins at shoulder height from around two-eighths of the overall height, narrowing rapidly toward the ground.

Drawing heads should not cause too many worries once one has studied and memorized certain proportions. The entire head is subdivided from top to bottom in seven sections. In the upper part a circle of 5/7 is drawn, in the lower part one of 4/7 diameter. The following proportions are important: the hairline comes at 1/7 down from the crown, followed by 2/7 head height as the forehead and temples. Eyebrows and the root of the nose come immediately beneath the forehead. The nose is about 2/7 head height in length and ends 2/7 above the chin. The mouth is located slightly above the bottom seventh (see Fig. 17.2).

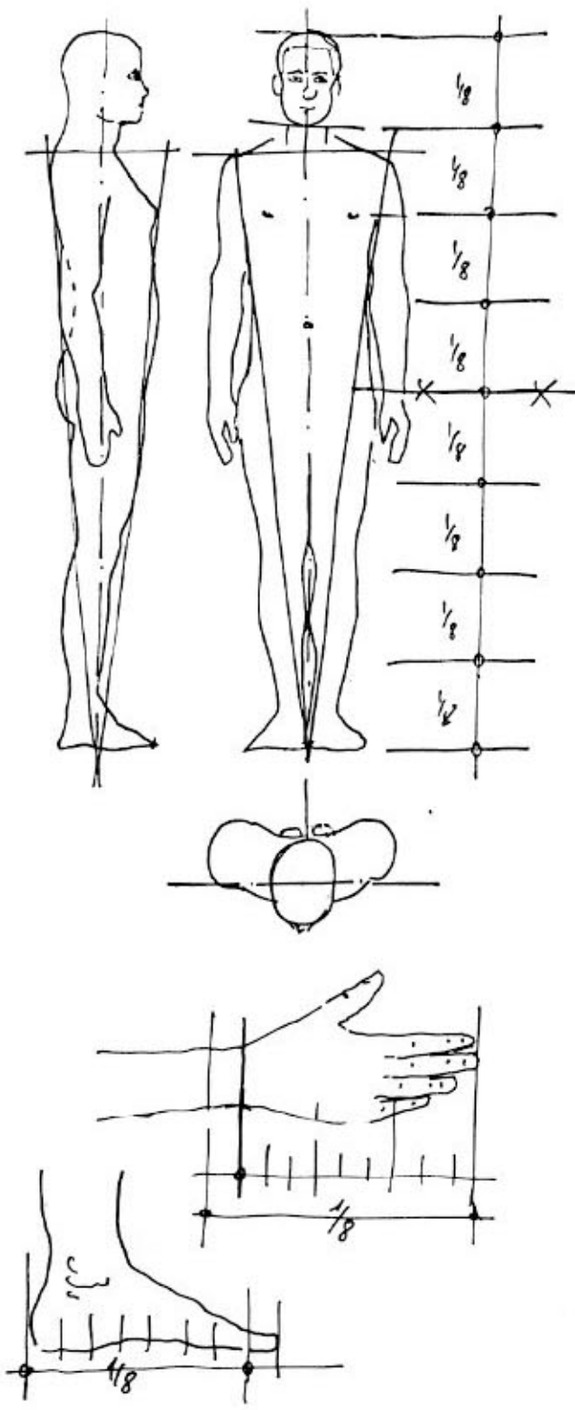
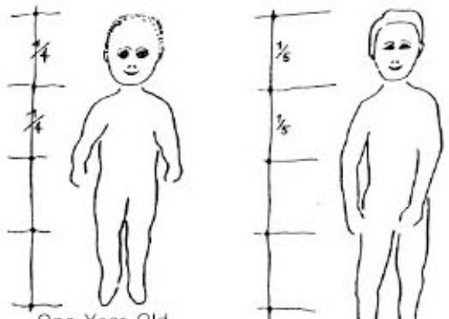


Figure 17.1



Here are some examples of figures shown in outline. This simple method of representing people is most suitable when the chief aim of the drawing is to show objects, in which case the figures should lend the illustration scale (sense of proportion) and a certain degree of expression. Once again the ground rules: as few lines as possible should be drawn; only the typical lines of the figure should be highlighted and stressed; areas need not be filled in; omit unnecessary detail.

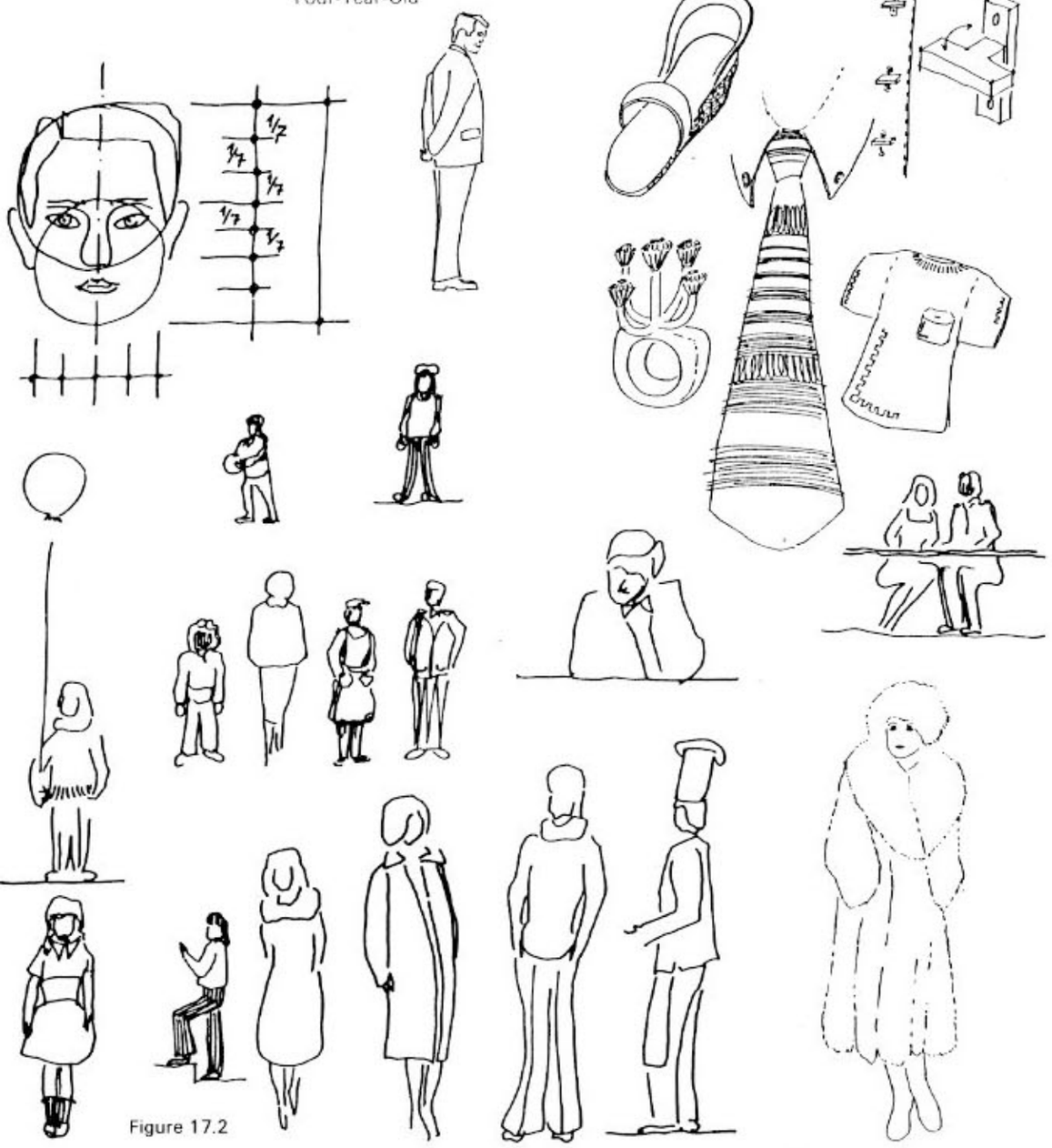
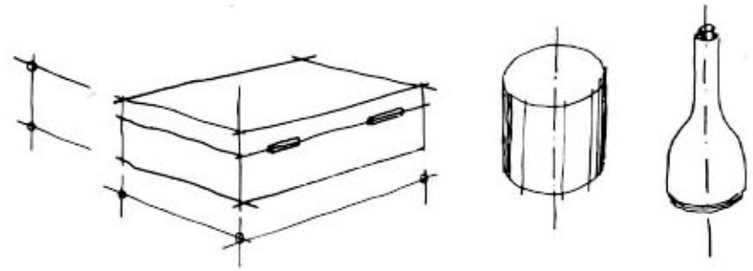


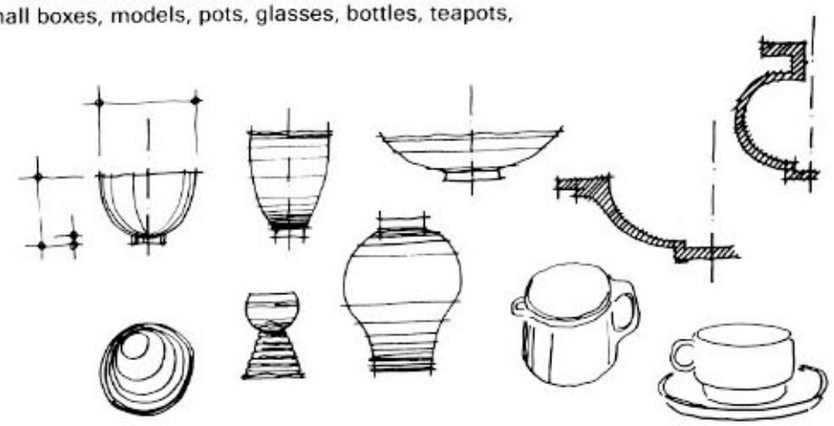
Figure 17.2

18.0 Motifs and Subjects: Some Practical Examples

Beginner's exercise: a simple box.

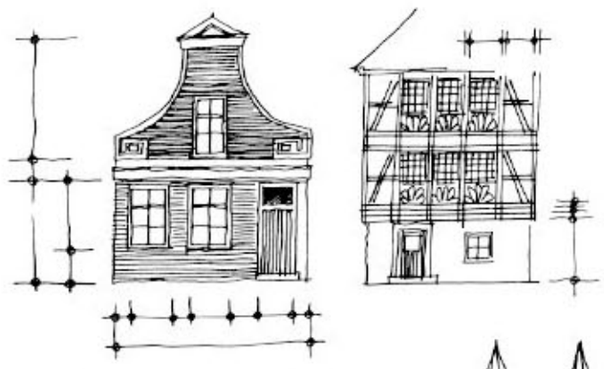


Experience shows that beginners choose far too difficult subjects. First exercises should be drawings of small boxes, models, pots, glasses, bottles, teapots, and that sort of thing.

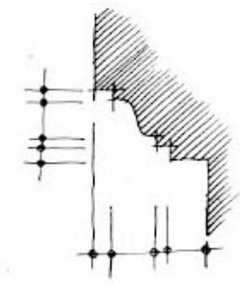


Next we should practice drawing frontal/orthogonal (rectangular) facades of houses, e.g., half-timbered.

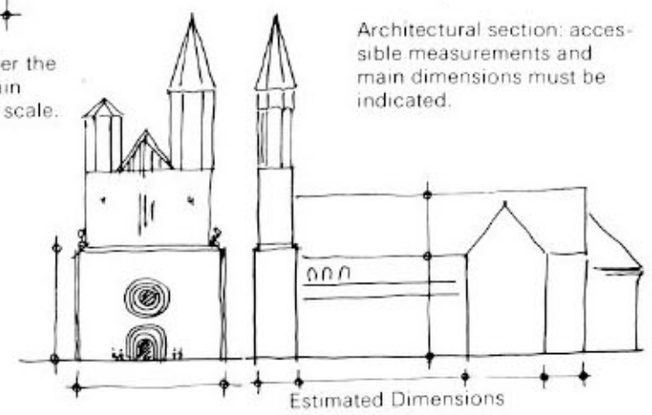
The main dimensions should always be indicated.



One should always enter the main proportions to gain training in control and scale.



Architectural section: accessible measurements and main dimensions must be indicated.

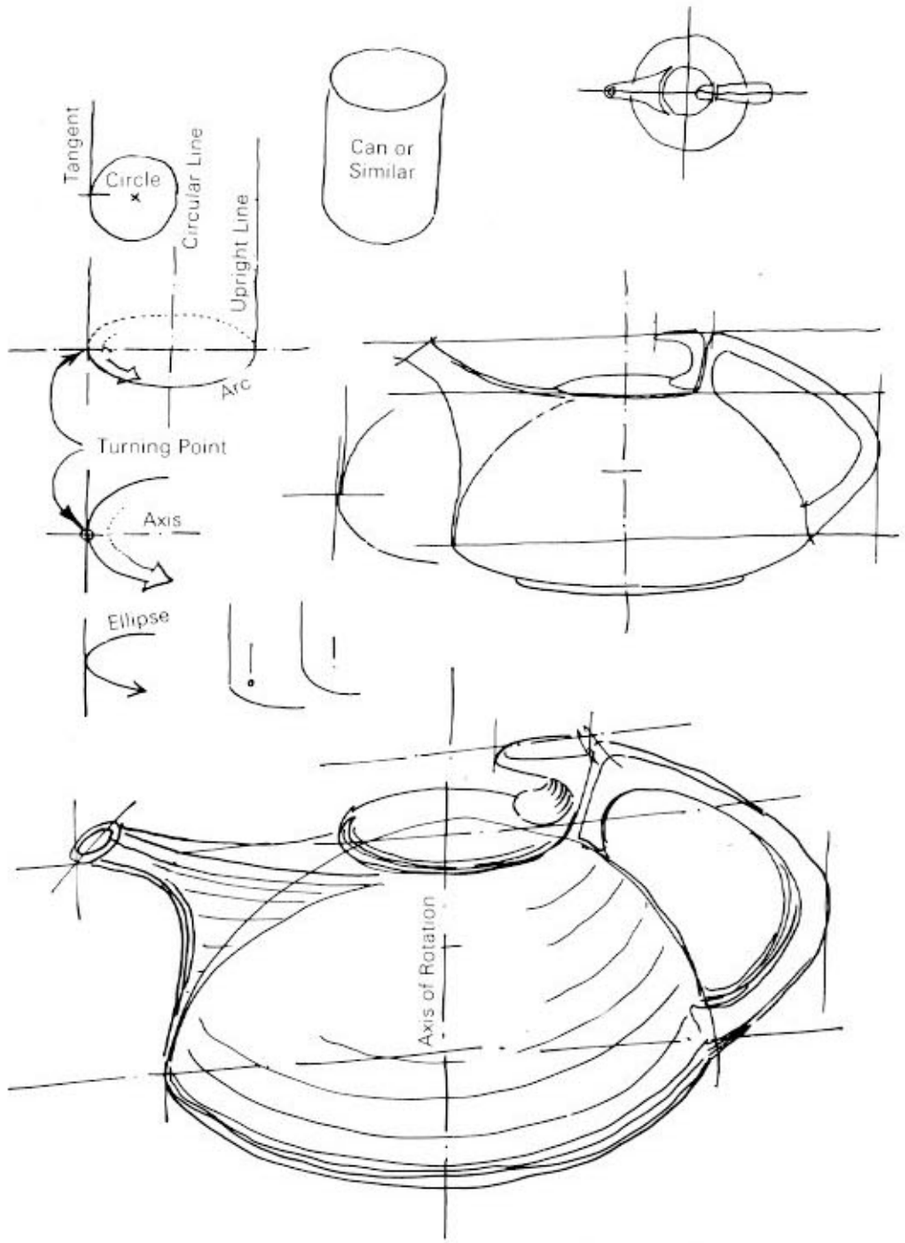


Estimated Dimensions

Figure 18.1

18.1 All Kinds of Containers

Drawing containers may seem rather difficult to the beginner, but it should come fairly easily with a little practice in observing and in the drawing of circles and ellipses. To begin with it is best to draw guidelines in the form of height lines and center axes. Another useful aid is the tangential contact between uprights and horizontal circles and ellipses. The turning point of the line is where the dotted axis in the explanatory sketch meets the arc of the circle. The fewer the lines drawn, the better and more convincing will be the overall picture of well-drawn objects. Shade should also be sparsely indicated.



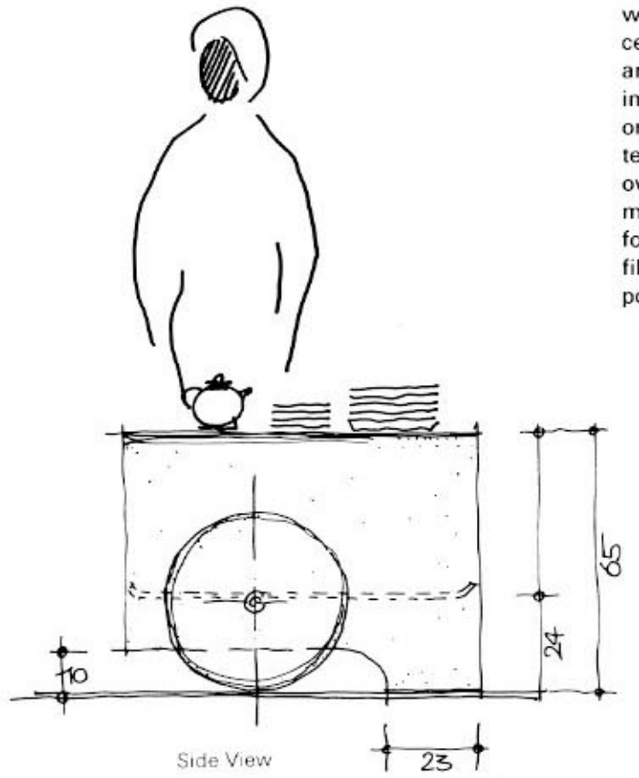
Original Size 22 × 31 cm

Figure 18.2

18.2 Quick Sketch of a Very Simple Household Object

The objects to be illustrated should show typical and few—but clear—forms.

A spatial view in the form of a perspective drawing with two vanishing points should always be preceded by drawings of ground plan, front elevation, and side elevation. In this way the onlooker will immediately recognize first the dimensions, second the proportions, and third any complex line intersections. A typical drawing should also indicate overall and individual dimensions. Small sections made in the frontal drawing can provide useful information as details (e.g., of cross-sectional profiles which are otherwise seen only as one of four possible external surfaces in the view).



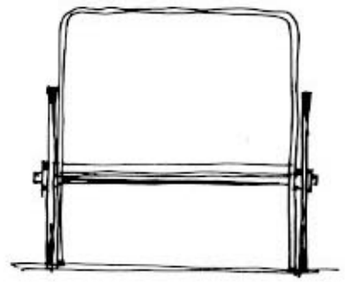
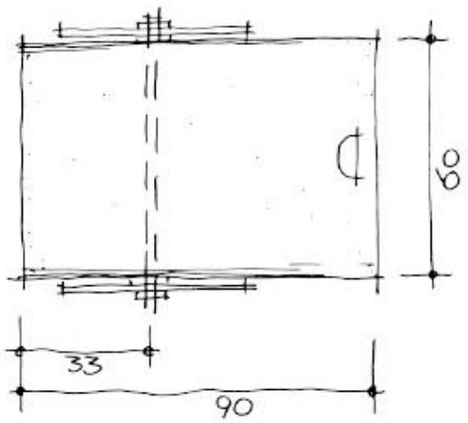
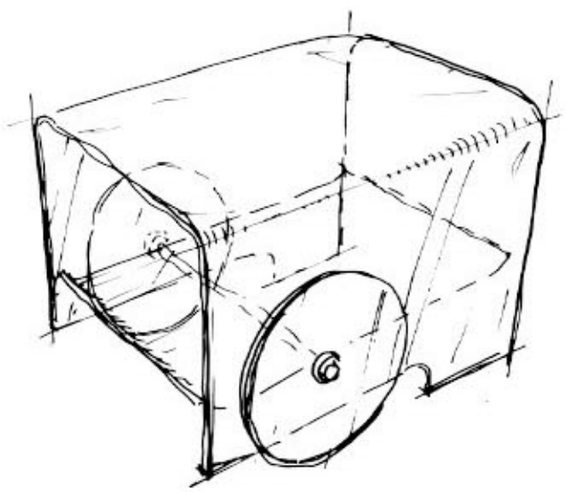

Front View

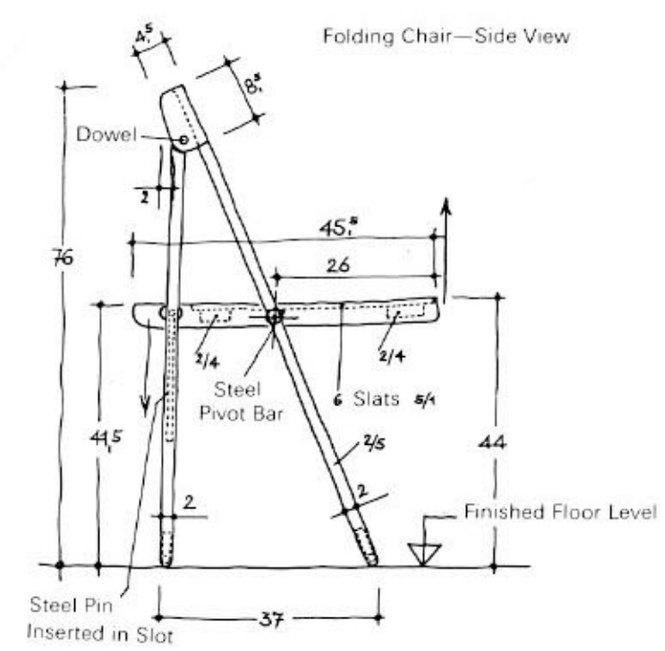
Figure 18.3

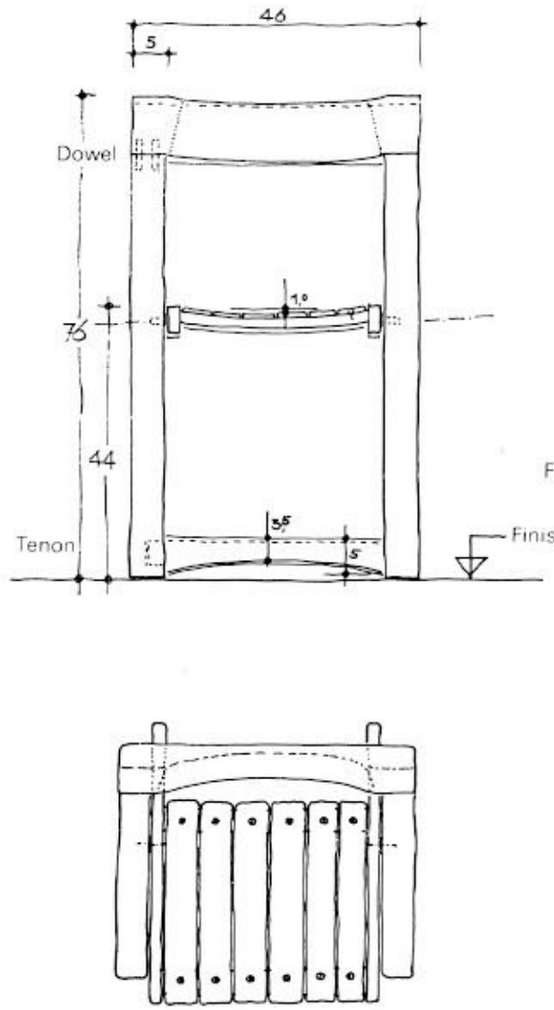
Original Size 33 × 20 cm

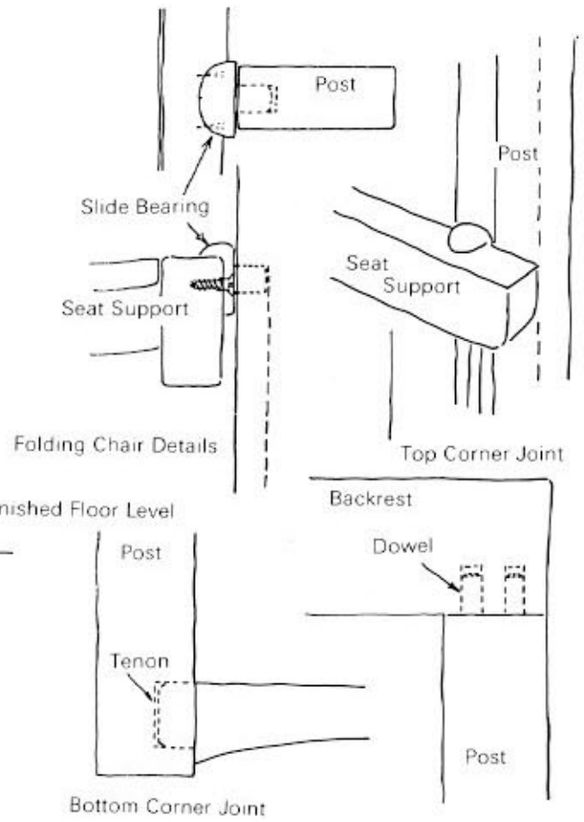


Top View



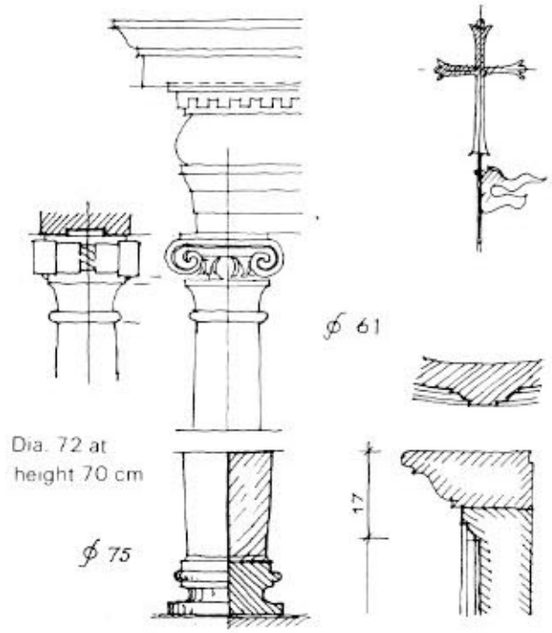




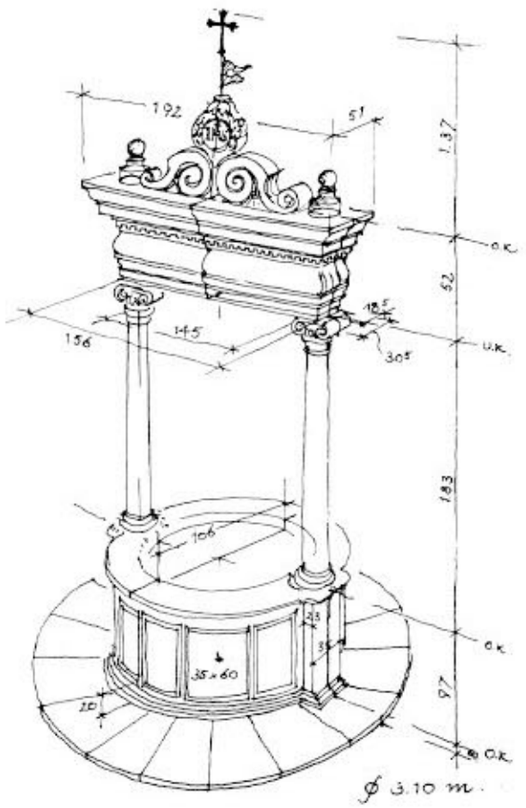


Original Size 36 × 52 cm

Figure 18.4



Ornamental well in the outer courtyard of the "Casa della Katharina," Sienna. Drawn during a trip to Italy on 9/20/1963. D. Thulesius



Original Size 27 × 19 cm

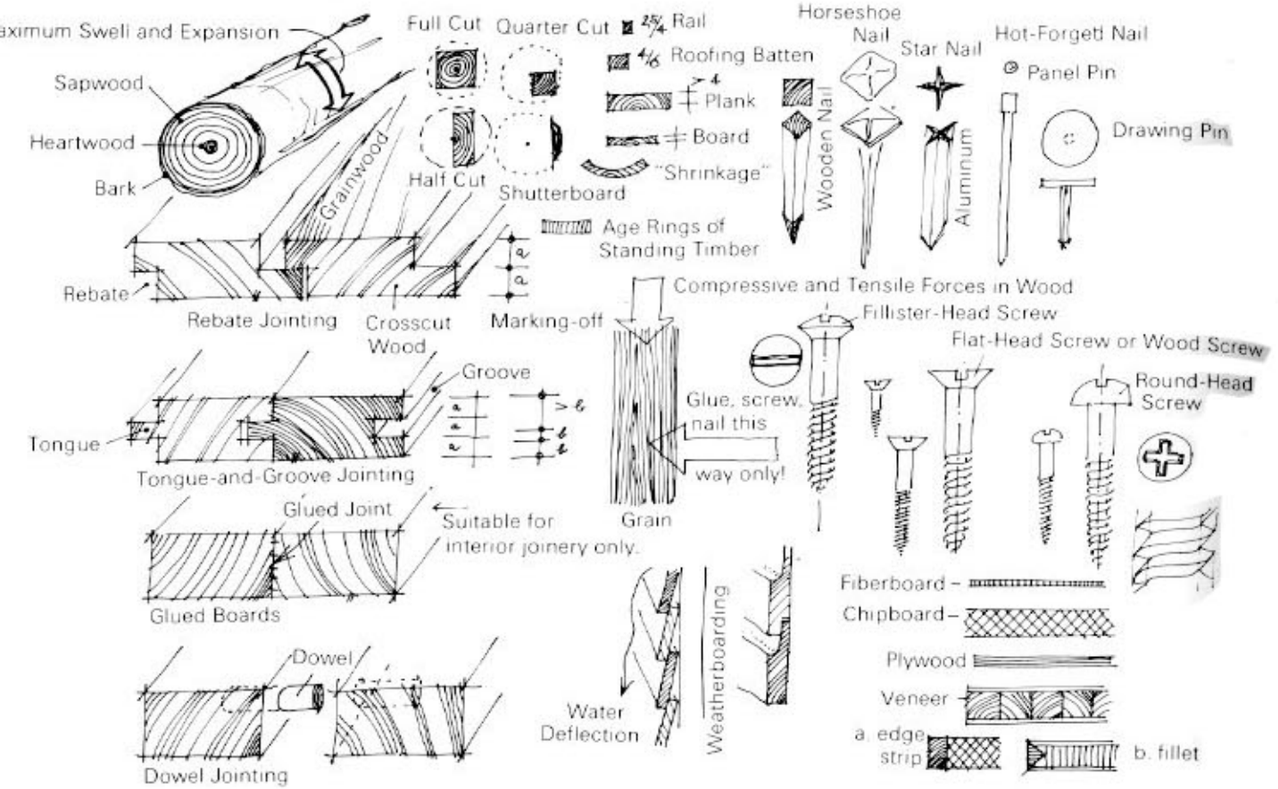
Figure 18.5

18.3 Object and Architectural Drawings

Architectural drawings can be made in the form of flowing freehand sketches. Drawings of objects and artifacts should be done with sufficient care so that a relatively simple object could actually be handmade without too much effort. Main views from the front, the side, and a view-from above (top view) should convey a good overall impression, and can be supplemented by explanatory information (details) regarding main structure and by formal statements. It is also advisable to add a small perspective view of the overall object. Further clarity is provided by overall and single dimensions, materials, colors, and surface finishes. Date, place, and other attendant details can also be added.

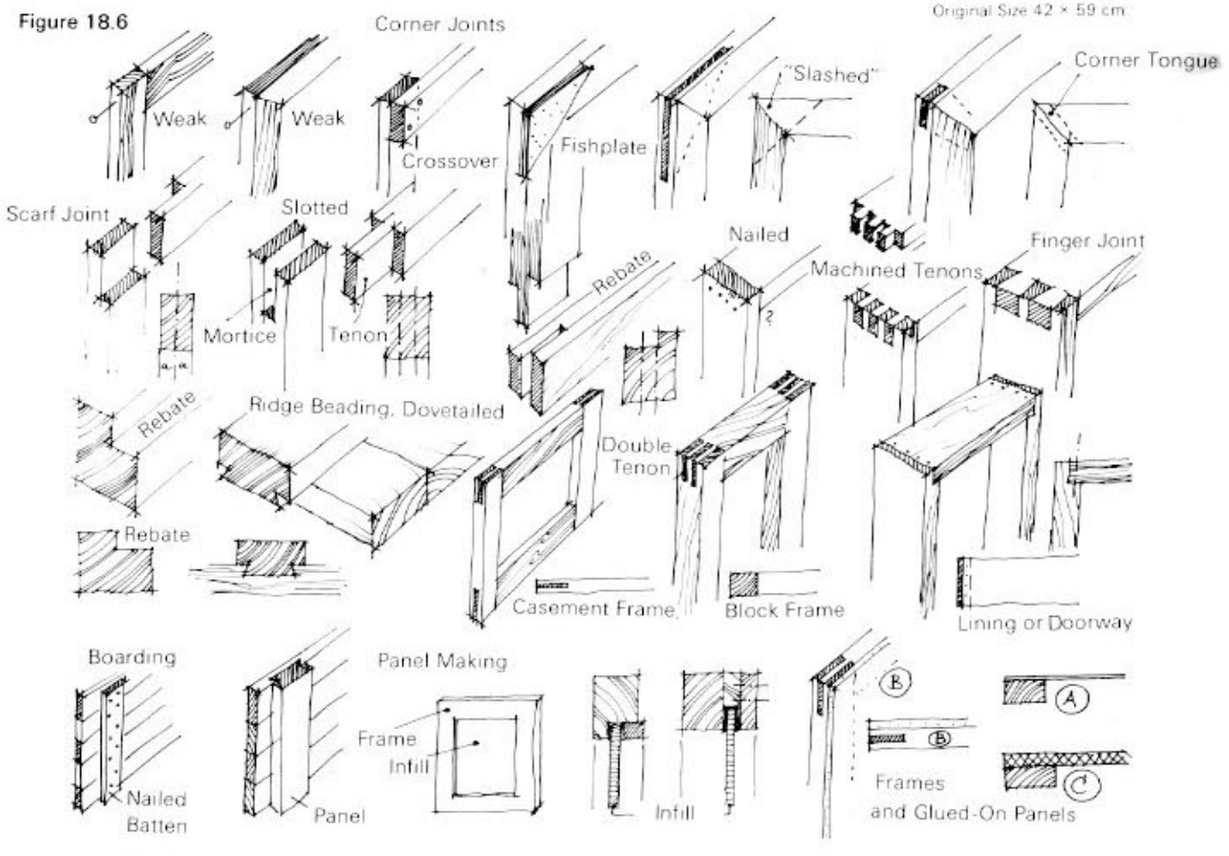
18.4 Extract Taken from a Lecture

Simple line sketches, presented clearly, can facilitate the understanding of structural parts and structural relationships. Like marks or symbols, they help to convey the basic subject matter and imprint it on the memory.



Original Size 42 × 59 cm

Figure 18.6



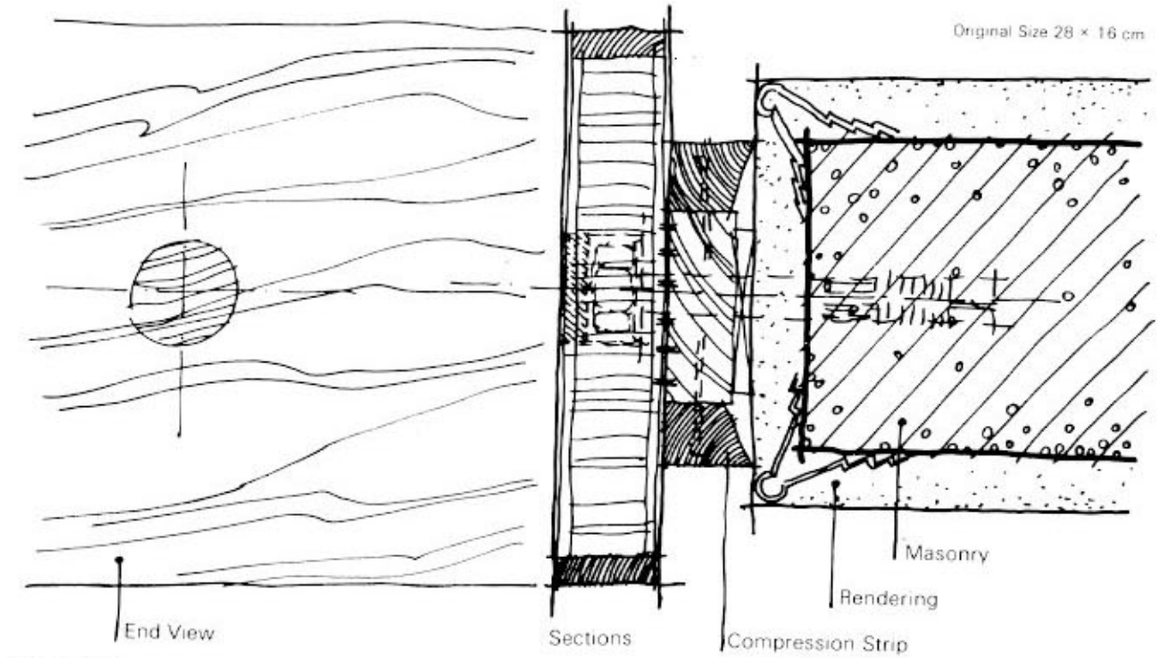
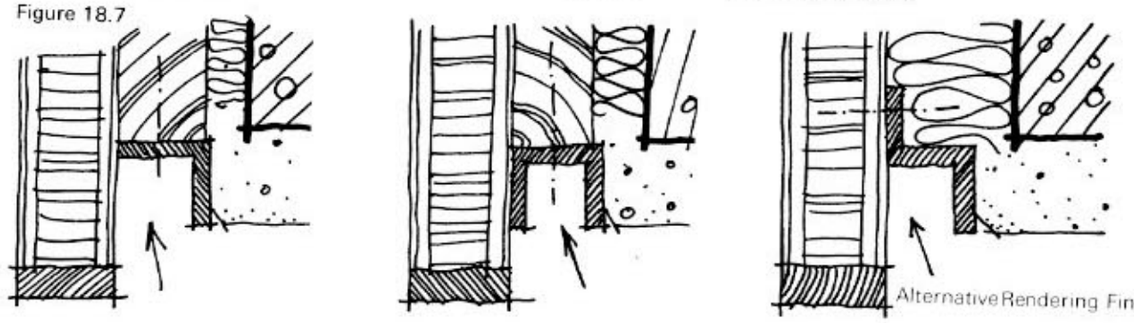


Figure 18.7



18.5 Detailed Section through a Timber Frame as a Masonry Finish

This example clearly demonstrates how one can quickly sketch materials, timber constructions, and visible surfaces with relatively rough strokes. Depending on the type of material, its structure, and strength, graphic density can be used to represent the material qualities at least approximately. Hatching and grain lines in the timber should only be lightly indicated, while actual edges should be drawn somewhat more heavily. Cross sections through timbers are best shown as quarter timbers—i.e., as quadrants of a circle filled in with arcs to represent an actual cross section through a tree trunk. With rectangular timber sections, the center of the circle (tree trunk) can be taken as being at one corner, then circular lines are drawn about that central point. The spacing of the rings in a tree trunk will vary from year to year according to the weather, and this too can be reproduced in a drawing.

Cross sections through the wall rendering can be indicated by light areas—since plaster is usually light in color—with dots to mark small grains of sand and to give a sense of scale to the cross-sectional area. The great strength of metals means that their sections will be very closely hatched. Since this strength is also distributed more or less evenly over the whole section, the outlines of the sections can be drawn thin and with the same thickness as the hatching lines. With general and detail sections it is always essential to include the background, adjacent faces (where visible), or technical guidelines drawn lightly. Just a few dots are enough to suggest the presence of a surface. Timber grain can only be drawn in the background where this does not cause a loss of clarity or legibility.

18.6 Freehand Construction of a Timber Staircase

The structural cohesion and eventual appearance of a building or other construction can often be indicated by means of a sketch. The main outlines are first measured off and drawn in freehand or lightly with a rule. Once the main lines of reference and points of intersection have been drawn, it is relatively simple to fill in the rest of the construction freehand. An almost realistic effect is achieved by the correct use of emphasis on light and heavy strokes. The practiced draftsman will be able to use this technique to identify and solve wider problem areas as well. The technique, which can do without tedious, exaggerated accuracy, will also increase drawing speed.

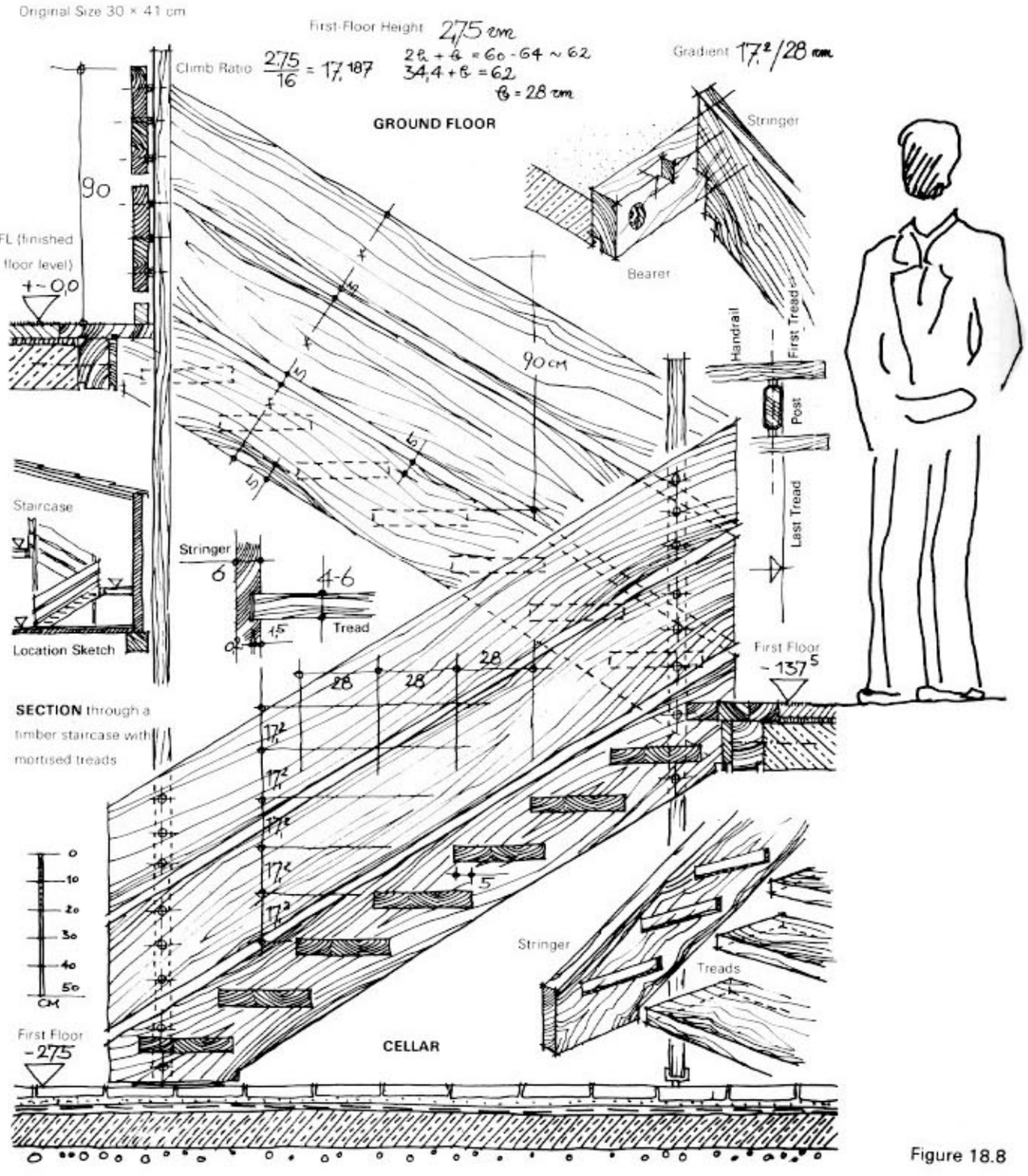


Figure 18.8

18.7 Sketches of Classical Furniture

This makes no great demands on the draftsman, provided the furniture has more or less closed forms. The horizon line is plotted first, as always. Then come the verticals, which also provide height-to-width proportions for the various faces. The vanishing lines converge left and right on common vanishing points on the horizon. If these vanishing points are unattainable, we can use scale lines to indicate the correct vanishing line direction.

Another drawing aid with symmetrically constructed objects—as is the case here—is the axis of symmetry which, once found, can be used to locate the correct points for the individual lines with the use of further scaling. Where there is shade or cast shadow, the timber faces can be provided with drawn grain lines.

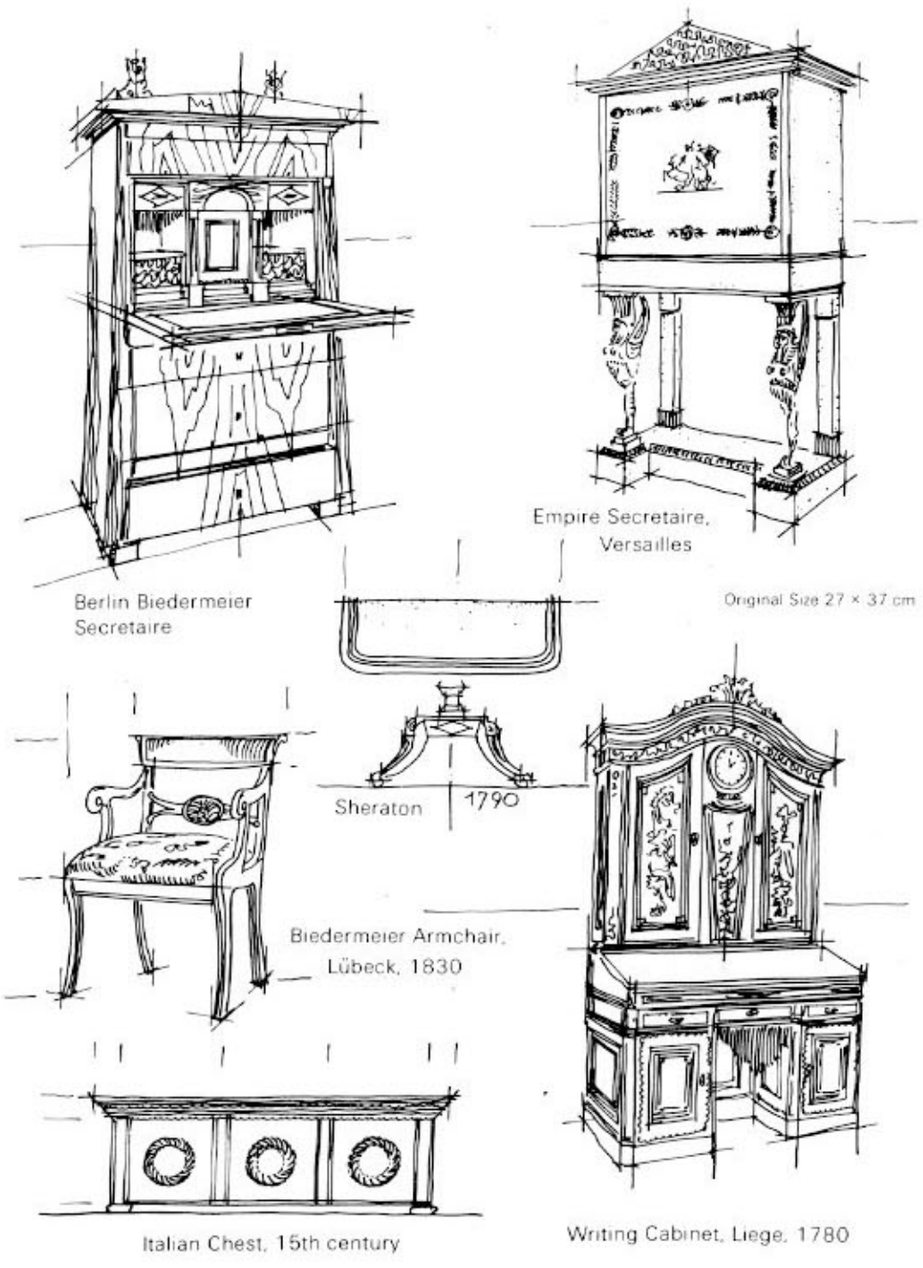


Figure 18.9

18.8 Sketches from a Lecture on the History of Architecture

These are routine examples of typical historical styles and were drawn in the lecture hall.

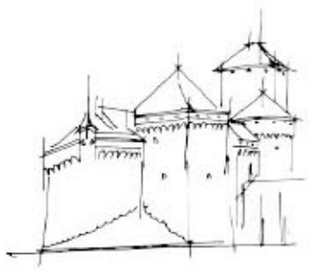
This kind of sketch is typified by its concentration on the most conspicuous parts of the structure, rapid execution, and the total absence of any "useless" ingredient. Shadow and detail are unimportant. The lines are simple, bold, and confident. No stroke is drawn twice. The lines can be interrupted at corners, etc. A lot of repetitious features such as rows of detail need only be partially shown. The spectator will complete the picture with details he has already seen and experienced.

The fact that many parts of small sketches seem too strong because of the thickness of the stroke should not worry the beginner, since it is typical of this type of illustration. If one needs to make a lot of small sketches like this, for whatever reason, one will eventually learn to pick out just the essentials of an object and then to set them down on paper in a very short space of time. Small details may be overlooked in the process, but this will make the outlines all the clearer.

Original Size 27 × 40 cm

Church of St. John, Schwäbisch-Gmünd

Maulbronn Monastery (14th century)



Castle Chillon (1100) on Lake Geneva

St. Ulrich, Goslar (1050)

Castle Eltz (1350), Moselle

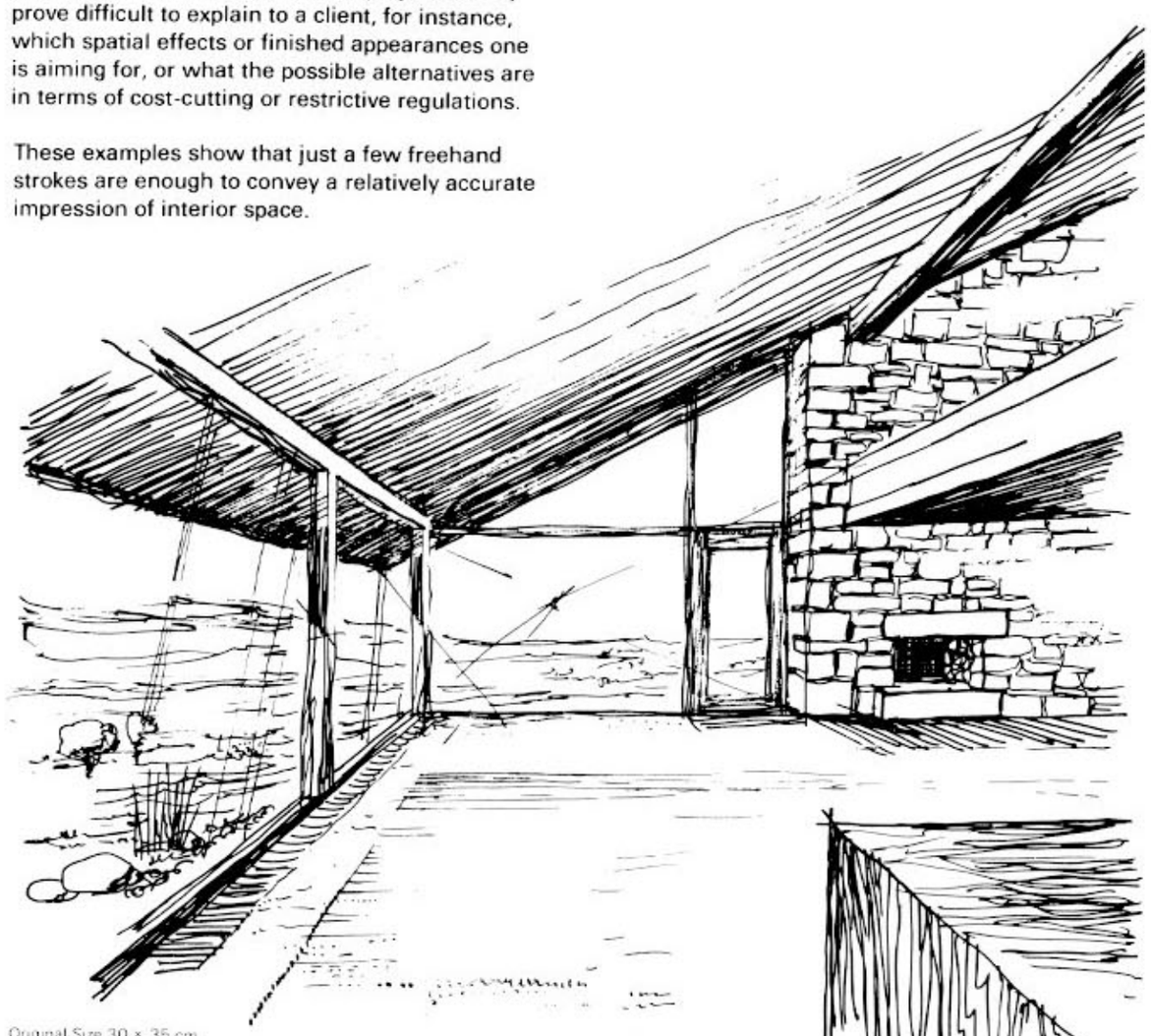
Pazzi Chapel, Florence (1409)

Figure 18.10

18.9 Interiors

Not everyone has the same powers of imagination, and with some building or design projects it may prove difficult to explain to a client, for instance, which spatial effects or finished appearances one is aiming for, or what the possible alternatives are in terms of cost-cutting or restrictive regulations.

These examples show that just a few freehand strokes are enough to convey a relatively accurate impression of interior space.



Original Size 30 × 35 cm

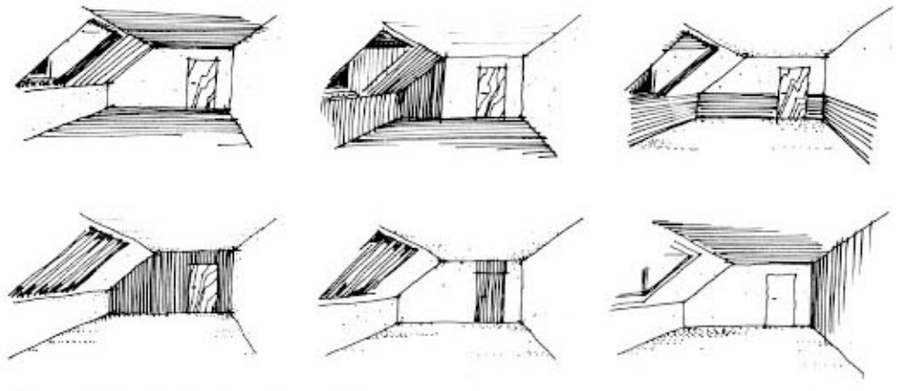
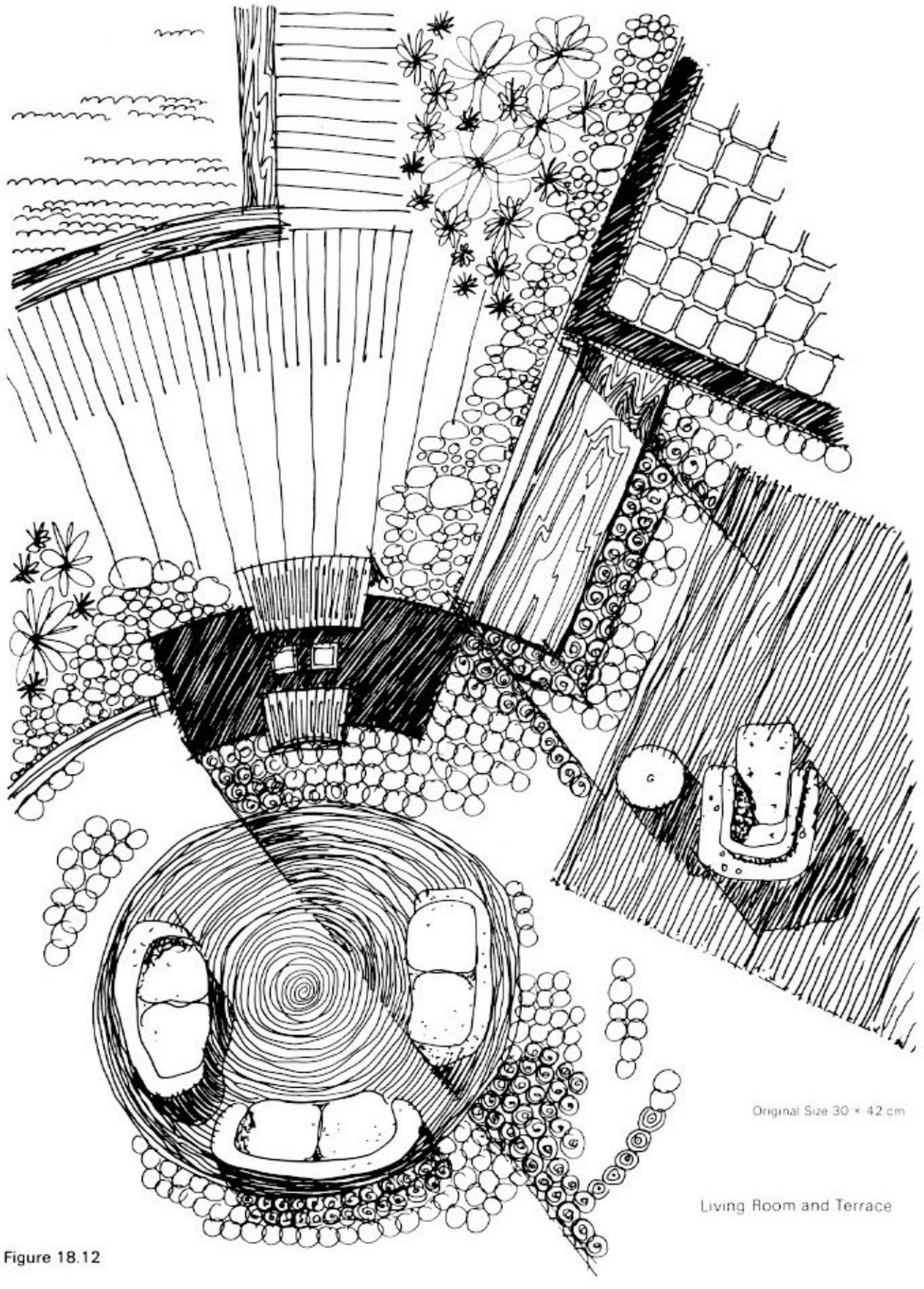


Figure 18.11 Six Freehand Details for Roof Pitches



Original Size 30 × 42 cm

Living Room and Terrace

Figure 18.12

18.10 Exterior Views of a Shop and Cafe

With this more interesting but rather difficult job, the first step is to plot the verticals and the horizon line as shown in Figure 18.13. Next we determine the proportions of the various visible surfaces, drawing first their vertical and then their oblique lines. Glass as a building material requires little or no indication in this type of sketch. Surfaces which lie in shade or shadow can be darkened by hatching. To give the less imaginative viewer a better idea of the substance and volume of the solids, it is sometimes useful to add a small ground plan in one corner of the drawing. Human figures complete the sketch by suggesting scale and size.

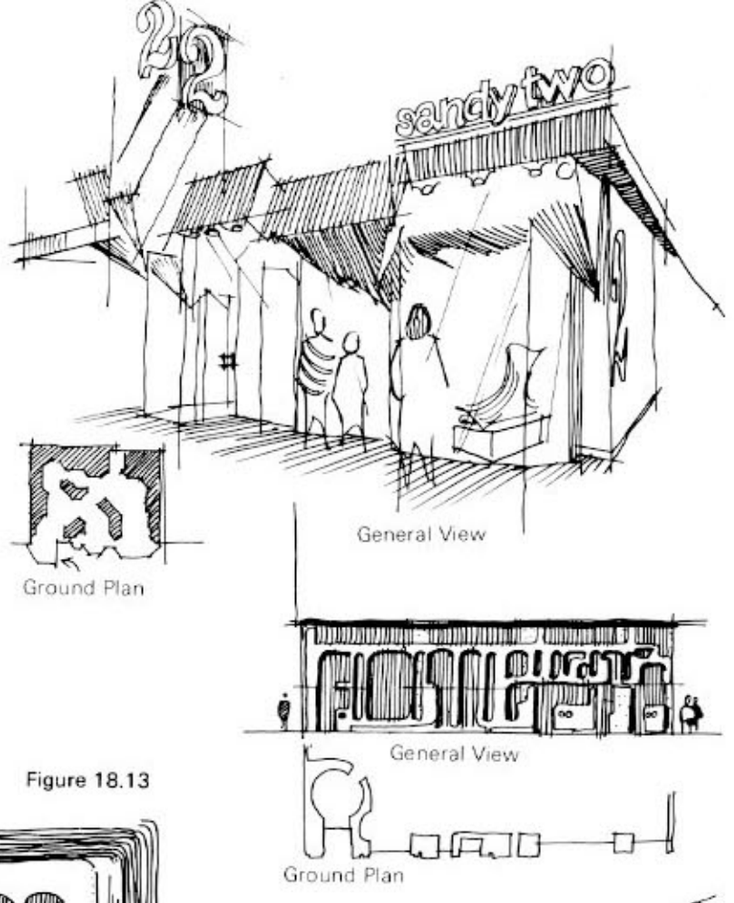
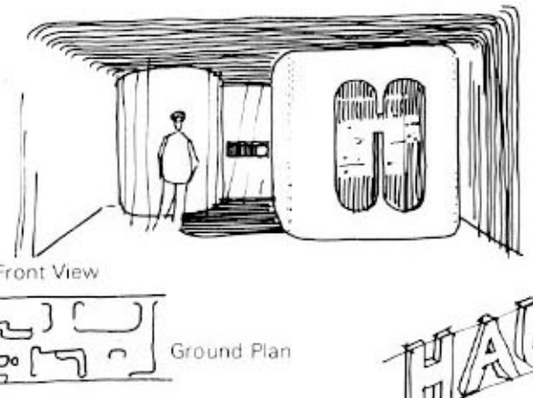


Figure 18.13



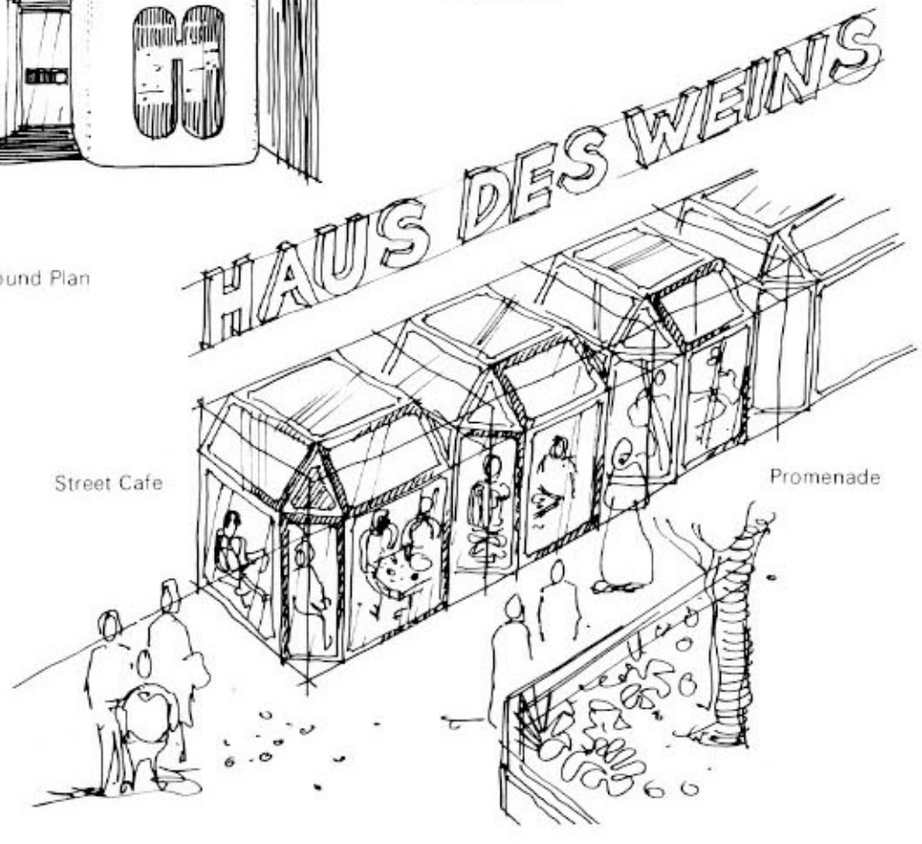


Figure 18.14

Example of a very rapid sketch that might have been made in a cafe on the back of an envelope.

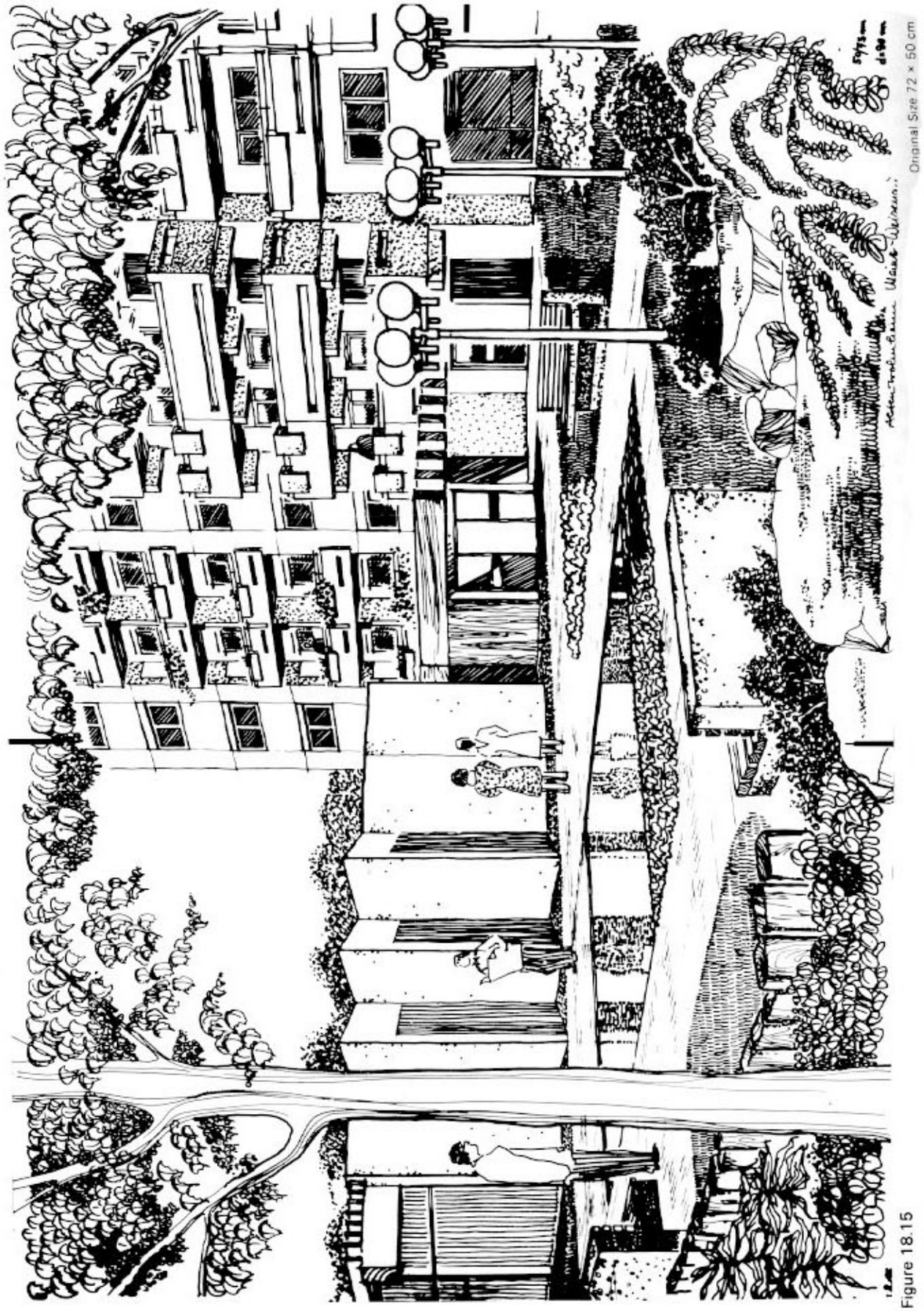


Figure 18.15

18.11 Artist's Impression of a Building Project

An exterior view should give the client a proper visual impression before construction commences, and the first thing is the precise design of all parts of the building. The aim of obtaining a complete and uniform image was achieved here by generally illustrating with lines—there are no completely black areas. Hatching replaces surface detail. All light gray, dark gray, and other tonal shades are represented by texture, structure, facture, and hatching. The contrast between light and dark areas is intended to give the picture a certain density and substance. The overhanging branches and foliage frame the building and lend a sense of depth to the drawing. Plants, grass, and stones in the foreground can be shown in great detail, but lose their sharpness with increasing picture depth. The strokes are shorter and thinner.

The building is given substance by the contrast between surfaces lying in direct sunlight and others in shade. Glazed areas and small windows within illuminated surfaces are best represented by dark, close hatching; the building facade will then appear bright against them. This optical effect is frequently observed in bright daylight and especially in buildings without curtains at the windows. It is best to leave the sky blank against the leaves on the tree, the tree trunk, and the undergrowth; the lamp globes should also be left plain against their background. To give the single-storey building greater volume against the bright sky beyond, the trees in the background are shown with dark leaves (dots). This building's windows are also close-hatched to indicate darkness. Finally, there is an appropriate entrance and human figures to give an impression of scale.

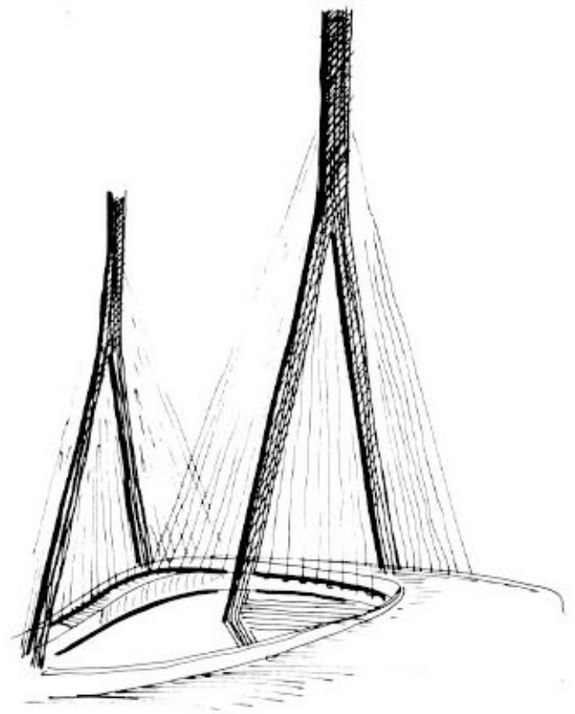


Figure 18.16

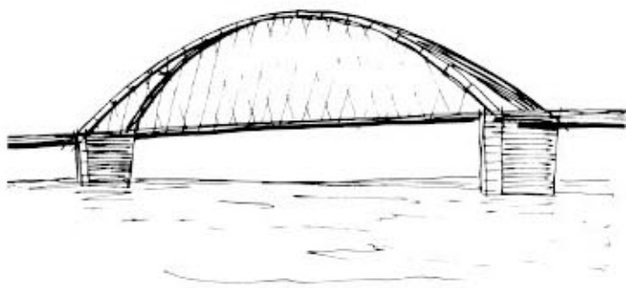


Figure 18.17

18.12 Civil Engineering Projects

These can be drawn freehand very easily in spite of their often huge dimensions. All the rules of perspective of light and shade and of simple stroke and line apply. The choice of a scale that corresponds with the human eye level will produce adequate expressions of solids and space.

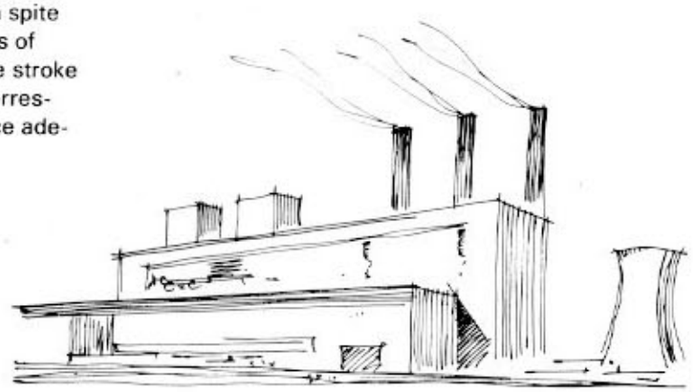


Figure 18.18

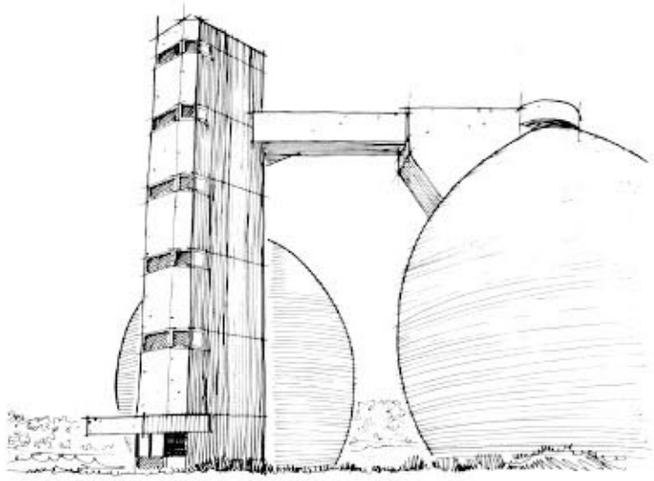


Figure 18.19 Civil Engineering Project—Purification Plant

18.13 Layout of a Chemistry College

When sketching layouts like this it is important to pick out the essential structures and exterior spaces in simple lines. The buildings are just sharply outlined—their floor areas are left plain as are roof areas. In contrast, landscaped areas should be close-hatched. The trees are shown as plain circles. The layout is given a feeling of substance by the inclusion of shadows cast by diagonally incident sunlight. Cast shadow is shown along two sides of rectangular buildings depending on their elevation.

18.14 Ground Plan of a Chemistry College

The various rooms are arranged with their appropriate communicating routes with the aid of an orientation grid. Corridors are close-hatched for added clarity. With a little basic experience in the reading of plans it will be easy to see where buildings are located and wall structures are positioned. The critical zone of the drawing lies in the transitional areas between exteriors and interiors. An overindication of green spaces can well blur the overall impression of the building itself, while too sparse an indication will fail to identify a given area as interior or exterior.

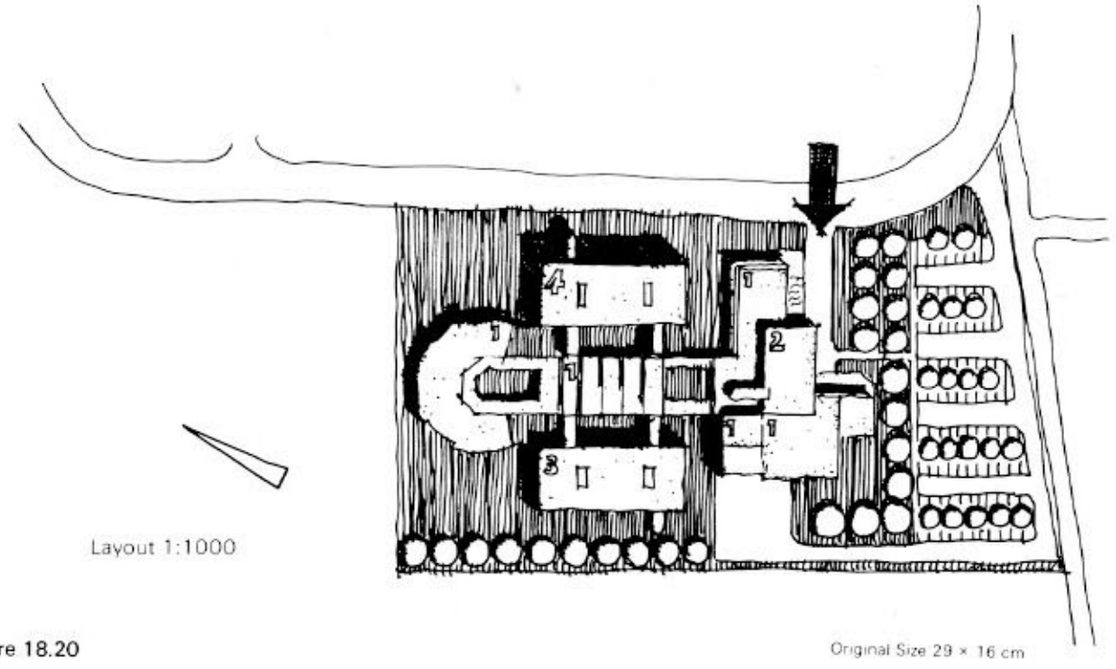


Figure 18.20

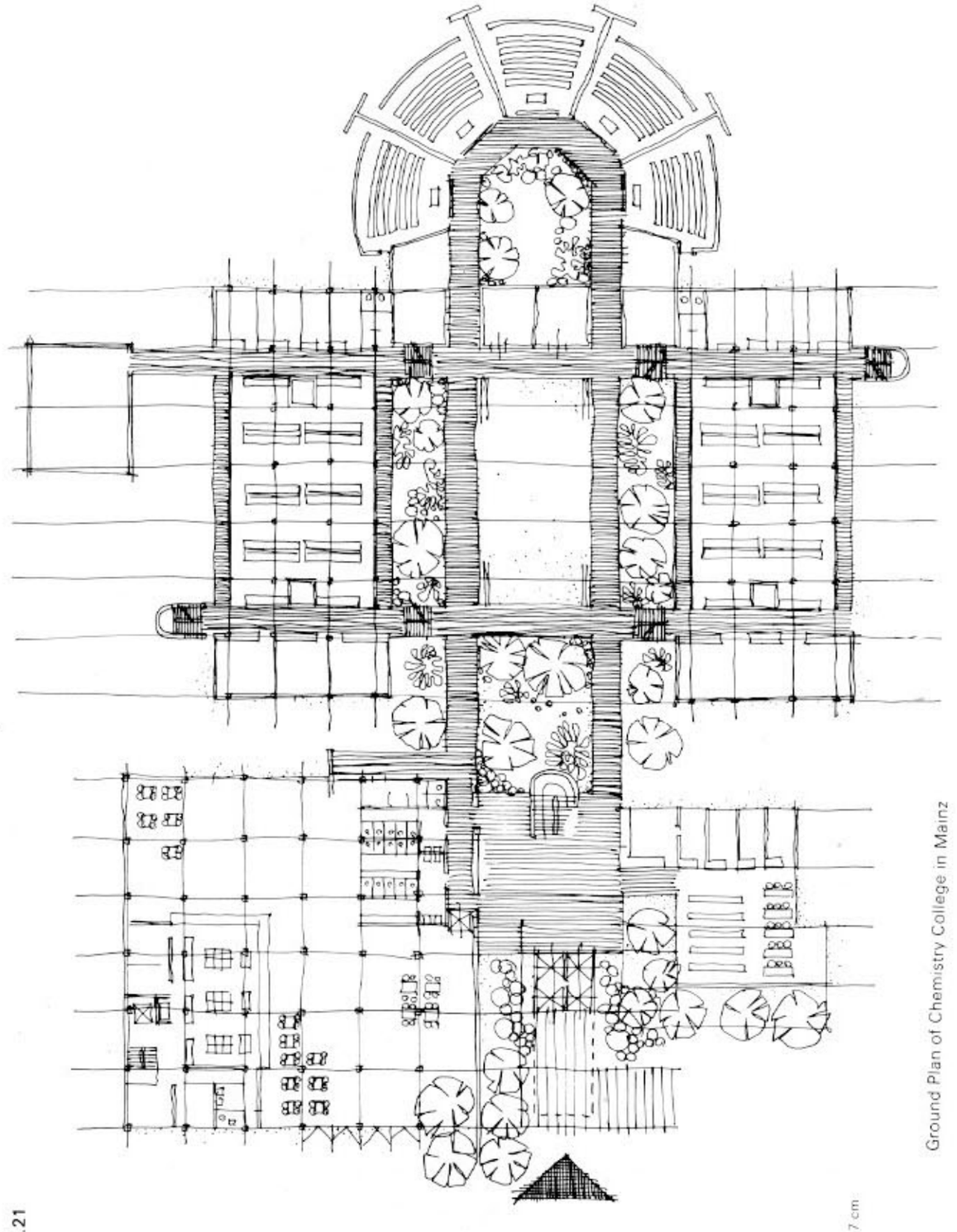
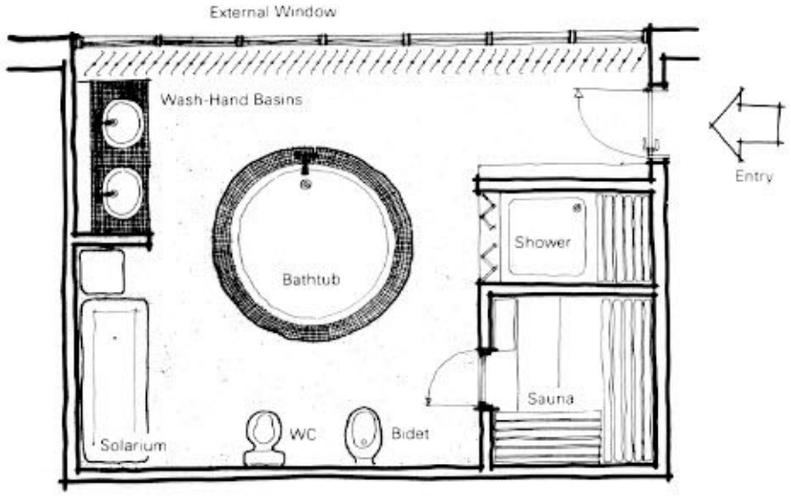
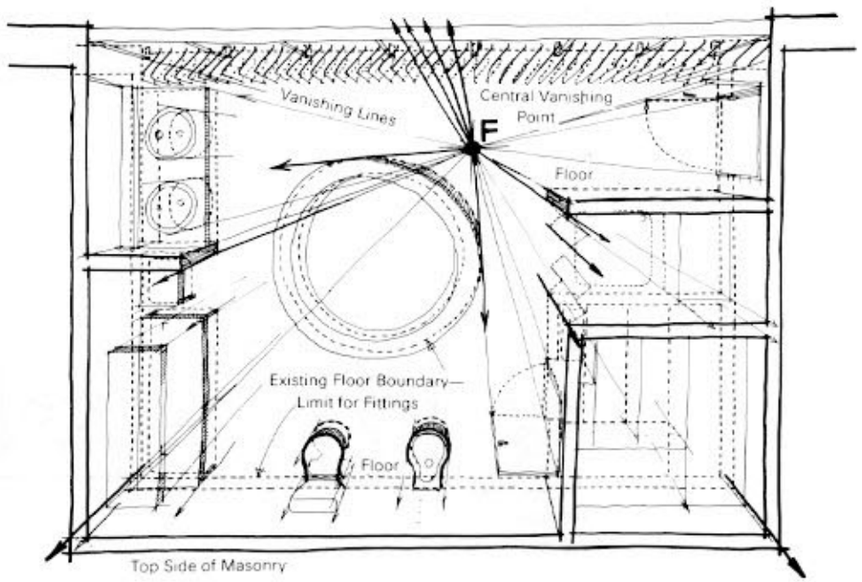


Figure 18.21 Ground Plan of Chemistry College in Mainz

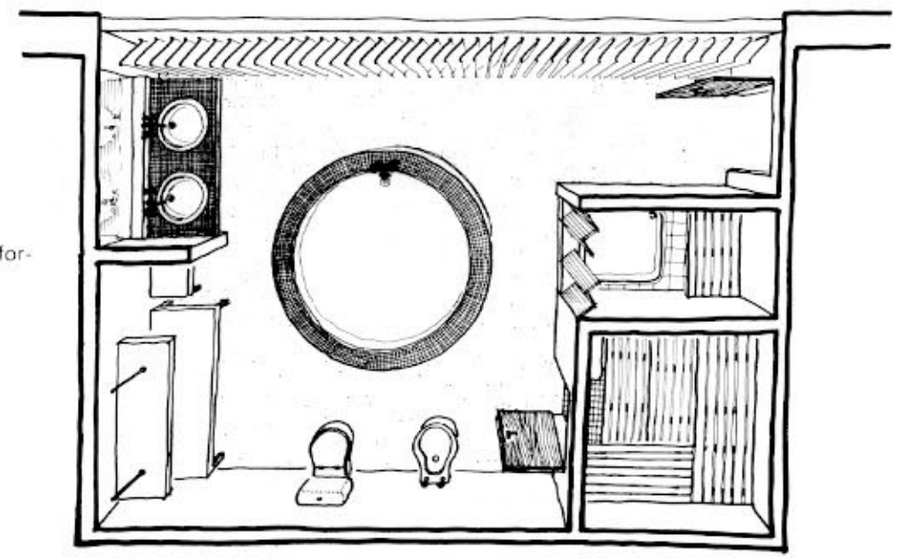
Sketch ground plan is not always sufficiently legible or clear to the layman.



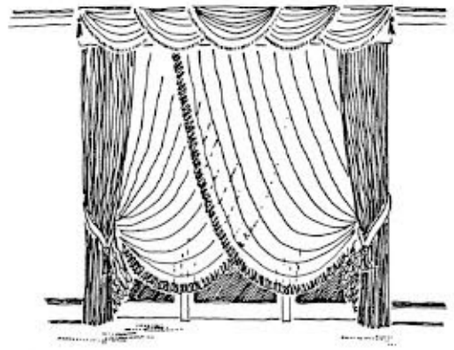
General view over the ground plan developed with vanishing point.

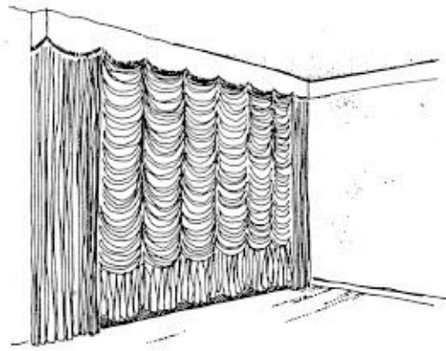


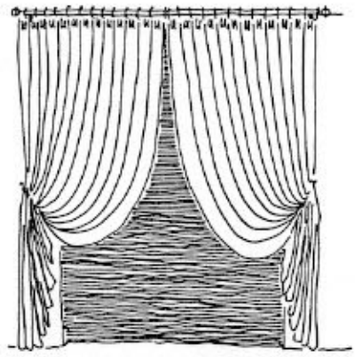
View into the room as informative sketch.



It's the same with any drawing: locate typical lines and edges first of all. Look for light-dark contrast between surfaces. Lines should nearly never touch each other, let alone cross each other. Some exaggeration in line thickness and spacing can help to illustrate the situation.







These examples are not great works of art, nor are they intended to be—the main thing is to be able to make rapid yet convincing sketches for, say, consultancy purposes. Here again, experience shows that just a few lines can make for the most clarity and expression. Here for instance the curtain rings are drawn as single short strokes.

Curves can often appear uncertain and inaccurate. The eye automatically turns the lines into forms and outlines it has seen again and again in real life.

19.0 In Place of a Postscript

Our environment, both the beauty of nature and man-made townscapes, has been captured aesthetically and impressively in drawings for many centuries.

This same environment is under such constant and intensive threat every day that the next generation will be able to experience and illustrate only a fraction of aesthetically pleasing natural and cultural landscape.

Directly or indirectly, it is man himself who is disfiguring and destroying the world. It begins by carelessly and thoughtlessly throwing away a plastic bag in a wood or into a river and ends in unsightly rubbish dumps on the margins of city, forest, and field. Or it can start by someone changing his car oil and allowing the old oil to seep away into the soil. The result is always the same: a destroyed environment means a lower quality of life.

Polluted water and air are not just harmful to our bodies, they increasingly take away what nature and man have created over thousands of years. Just think of the entrance to the Parthenon in Athens that had to be closed to the public because of the risk of damage from environmental influences; the statue of Marcus Aurelius in Rome is also threatened, and nearly everywhere cathedrals and stone sculptures are being eaten away by pollution in the atmosphere. No wonder smaller works of art are kept safe in airtight showcases.

Nature's balance too is being eroded more and more. Many species of fish, birds, and mammals have lost their once healthy life-supporting environment and are on the verge of extinction. Everything we call "beautiful" is gradually disappearing, and so everything which we take pleasure in drawing will have to be sought after more and more.

And what can we bequeath to our descendants? Bringing children into the world seems much easier than offering them a tolerable world. The responsibility for a better environment in the future rests will us all. We must develop alternatives!

Let us hope that the art of freehand drawing and the privilege of being able to draw within a harmonious, well-formed environment will help us arouse more interest in a better quality world.

Perhaps then man might spend more of his energy on protecting and preserving the environment.